AMERICAN GAS ASSOCIATION

Monthly

DECEMBER
1950

Beautiful to behold!

and so automatic

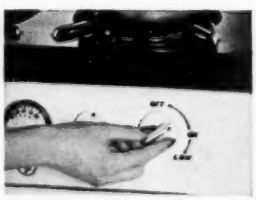
you can love it and leave it!

You'll fall in love with cooking all over again when you change to a *new* Gas range. It's so *beautiful* you can't stop looking at it...yet so *automatic* it cooks a complete oven meal without a glance from you. Cool, clean, *instantly fast* —it not only gives you more than any other modern range but costs you *less!* Less to buy. Less to install. Less to operate! No wonder millions are choosing new Gas ranges every year!

NEW FREEDOM GAS KITCHEN DESIGN

HARDWICK "CP" GAS RANGE—ONE OF MANY ALL NEW. ALL AUTOMATIC GAS RANGES BUILT TO "CP" STANDARDS.

Complete clock control!



Any heat—instantly!

Smokeless broiling!

GAS has got it!

FOR MODERN COOKING, REFRIGERATION, WATER-HEATING, HOUSE-HEATING, AIR-CONDITIONING, CLOTHES-DRYING, INCINERATION

AMERICAN GAS ASSOCIATION

• Typical advertisement in A. G. A. series for September-December which features individually the gas ranges of seven participating manufacturers

This month's cover: Santa's sleigh awaits as he delivers an automatic gas clothes dryer to rid another family of the "wash day blues." Standard Oil Co. (N. J.) photo

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GAS industry representatives are appearing before a Congressional hearing on excess profits taxes, as the Monthly goes to press. They will attempt to show that a steady flow of capital is essential for gas companies to meet public demand, and that adequate savings are required to attract such capital. . . . Action is also pending on future steel supply. Estimates of the gas industry's steel requirements have been prepared by the A. G. A. National Defense Committee. This report will be presented at a meeting of steel manufacturers and Commerce Department experts in an attempt to develop a workable program and give the gas industry its deserved priority position in the defense mobilization picture. . . . At the same time, gas men in general are busy mapping strategy for next year. Executives, servicemen and other groups should find valuable information in this month's article on the Atlantic City appliance exhibition. . . . How to tell the story of the American business system? How to determine suitability of standby gases? What are the obligations of casualty insurance? Answers to these and other questions provide a balanced diet of information as we near the end of 1950—truly a year of decision.

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Summary of Atlantic City exhibition's highlights shows valuable new developments and changing trend in the design and operation of gas-fired equipment

Gas appliance preview indicates

If all the 172,000 employees in the gas utility industry* had been able to attend the exhibition of gas appliances in Atlantic City this fall the result undoubtedly would have been a new enthusiasm and a firm conviction that we have better appliances to fill customer needs than ever before.

Those who were fortunate enough to attend the 1950 Convention and Exhibition must have returned to their companies confident that, unless war emergencies seriously disrupt availability of equipment, new sales records will be set in 1951. This review of the Exhibition's highlights should be helpful to those in management jobs, sales, servicing, home service and other departments, who must plan months ahead for the advent of more modern, more durable and more efficient gas-burning equipment in the new year.

What improvements and new developments in gas appliances are now available to gas companies and their customers? What is the significance of the changing trend in the design and operation of gas ranges, water heaters, house heaters, incinerators, refrigerators, dryers, and other major appliances?

This article was prepared by members of the Utilization Bureau, American Gas Association—C. George Segeler, utilization engineer, and Edgar A. Jahn, Ralbern H. Murray, Evelyn M. Kafka.

* Total as of the end of 1949 (See Gas Facts, 1949).

Recognizing the growing threat of competition for domestic cooking, two manufacturers presented at Atlantic City spectacular factual demonstrations of the advantages of gas service. These dramatic demonstrations of gas vs. electric top burner performance emphasized the important advantage that gas ranges have an infinite number of input settings. On the gas range, a pressure cooker was brought to the desired pressure first and maintained there—demonstrating the superior speed and flexibility of gas and gas cooking equipment. This is a demonstration which can be repeated by anyone owning a gas range. It definitely gives us something to talk about!

Expanding on the exhibits of 1948, this year there were four New Freedom Gas Kitchen exhibits offering new features of convenience as well as outstanding appearance. All of the package kitchens featured ventilation of the range. These kitchens also illustrated how flue products from the gas refrigerator readily can be collected and distributed so as to prevent wall discoloration from dust which settles wherever there are rising warm air currents.

Ventilation was also featured in a first-time exhibit of a Type B vent material. Type B is the designation used by the Underwriters' Laboratories to designate vents and flues specifically adapted for a gas appliance. The new product was designed to overcome the problem of venting wall heaters

ate many improvements ahead for 1951

and eliminate the former difficulty of discolored wallpaper at points immediately above a wall heater. This new product promises to be increasingly important in solving the venting problems of new houses wherever Type B chimneys can be used.

Proper and safe venting of equipment is also a difficult problem in existing buildings because chimneys may be too small or non-existent. In addition, the most desirable location for a heating unit may be such that it is impractical to connect it to an existing chimney. In such cases this double-walled metal flue pipe is particularly useful. It is available in shapes and sizes that can be installed conveniently in the stud space of walls due to its incorporation of a ventilated air space. The temperature of the outer wall is so low that it has been approved by the Underwriters' Laboratories in applications where the flue pipe is actually in contact with combustible construction. New design in the method of connecting sections of the flue and inserting fittings makes installation of these flues much easier than that formerly required with similar flue sections.

Also of interest to the installer is the new pre-cast sectional chimney that was on display in Atlantic City. This type chimney is designed for installation where ordinarily a brick-lined chimney would be used. Its chief advantage is that it permits the erection of a chimney at a great saving in time and cost. Another advantage is that its relatively light weight permits its use in locations which could not support the load of a conventional brick chimney.

From this brief taste of what is to come, it is evident that the gas industry has more to offer its customers than ever before. The following brief review provides in quick reference form the highlights of new developments shown in Atlantic City. It is hoped that this information will help to stimulate wider markets for gas appliances—one of the exhibition's prime objectives.

Sixteen range manufacturers have introduced automatic oven and broiler ignition *without the use of constant burning oven pilots.* Basically, the new ignition systems are of two types—one uses the top burner pilot as the ignition source while the other uses an electric coil as the igniter. Both systems are entirely automatic, for it is only necessary to turn on the oven or broiler gas valve in order to accomplish ignition. Built-in safety features insure that no gas can flow to the main burners unless the ignition source is operating.

From the customer's viewpoint the new automatic range ignition devices are highly desirable. They will insure that oven and broiler compartments are at room temperature when not in use and hence can be used for storage should it be de-

sired. This feature is especially important where clock controls are used and food is placed in the oven hours before actual cooking takes place. The reluctance of customers to buy multi-pilot ranges is too well-known to require discussion here.

The new ignition systems may some day become universal. When they do, all homemakers will be able to enjoy the greater safety and convenience of automatic oven and broiler lighting. And wherever competitive situations are keen, the elimination of pilot operating cost will add another feature to our industry's sales weapons.

Use of automatic range ignition devices that do not have multiple constant burning pilots also provides the maximum in consumer comfort—little or no heat is released into the kitchen when the range is not in use. In certain LP-gas territories costs were relatively high. For such regions the reduction in monthly operating cost of the new ranges will bring a heretofore inaccessible feature within everyone's reach.

One manufacturer exhibited an A. G. A.-approved gas range which has automatic electric ignition of ovens and broilers as well as a novel means for lighting top burners without the use of a constant burning pilot. The top burner ignition is accomplished by means of electric coils which are automatically de-energized after ignition takes place. A range of this type will, therefore, use no gas whatever when not in use, as it eliminates the small pilot usually required for top burner ignition.

One company displayed range controls that eliminate *all* pilot burners but which are *not* automatic in operation. Ignition of top and oven burners is performed with electric coils that are energized by the user through push buttons on the front of the range. A range of this type has the advantage that no gas is consumed for pilots but it does require a simple manual operation each time a burner is turned on. Another advantage of a range of this type is that it would offer sales possibilities to those customers who cannot afford the more expensive luxury of complete automatic ignition.

A West Coast manufacturer demonstrated a feature which they hope to make available some time in the near future. This new development is the addition of clock control to a top burner of the range. Clock control has been used in the control of gas ovens for many years but this is the first attempt to apply it to top burner operation. The particular advantage claimed for this system is that the housewife can perform her other household duties without fear of overcooking and resultant food spoilage.

It frequently happens that the user of an oven in a gas range has no way of telling when the oven has reached the temperature set on the thermostat dial. Oven thermometers sometimes are used for this purpose, but in many cases their use is considered troublesome by the housewife. A control manufacturer displayed a new device designed to inform the user when a range oven has reached the temperature for which the thermostat has been set. A small green button on the back of the range lights automatically when the oven reaches the desired operating temperature. This new feature adds to the convenience of cooking with gas. It is only necessary to glance at the light on the back of the range to determine whether the oven is ready for use.

Many improvements have been made by manufacturers in the range tops, both from the point of view of appearance and operating convenience. It is now possible to obtain range tops either with chrome or *(Continued on page 37)*

Houston kitchens help A.G.A. project

Impartial drawing: Sue Amann, secretary to Personnel Director Kenneth Fellows, Houston Natural Gas Corp., drawing names of 20 employees who will receive privilege of purchasing new gas ranges to be field-tested in A. G. A. automatic ignition project. Grover Jones (left), secretary-treasurer, lends his hat as Sales Promotion Manager Sydney Bailey and his secretary, Betty Morrill, record winners

GAS INDUSTRY cooperation reached a new high level recently during the Association's new project for field testing 2,000 modern gas ranges equipped with ten different types of range ignition systems (a PAR Plan activity). Some 49 gas utilities, 16 gas range manufacturers and six control manufacturers are cooperating with A. G. A. in the series of nationwide field tests.

Dramatic illustration of the various practical approaches being used is the case of Houston Natural Gas Corp., Houston, Texas. The kitchens of 20 Houston Natural employees are now being used as "proving grounds" for the testing program. Selected from a list of 138 employees who had filed purchase orders, the 20 participating winners purchased CP gas ranges equipped with special ignition devices at less than factory cost. They are now maintaining simple operation records over a six to eight month period. In addition, periodic inspection of each range will be made by company representatives. Some of the other participating gas companies are using the same procedure in the tests.

Still another approach employed in the program is for the participating gas company to sell the test ranges direct to customers. Each range and its automatic ignition device will be checked monthly by service representatives of the company. Customers also will be encouraged to report any operational difficulties immediately.

The nationwide project climaxes several years of industry research on single-point ignition and is the most extensive field study of gas appliances ever undertaken. It is expected to greatly accelerate the development of a gas range which will consume little or no energy when not in use.

The executive and casualty insurance

Ewing Galloway photo

In the purchase of casualty insurance gas industry management assumes many obligations to its stockholders

By ROBERT SHIPMAN

Casualty Department
Alexander & Alexander, Inc.
New York, N. Y.

What obligations are assumed by gas industry management representatives to stockholders in the purchase of casualty insurance?

For the sake of convenience, these obligations may be broken down into five distinct groups: obligation to law; protection of assets; loss prevention services; keeping insurance costs down, and selection of a qualified insurance adviser.

First, we have an obligation to conform to the law. For example, the laws of some municipalities require Permit Bonds in connection with the granting of permission to open up the streets for any purpose, such as laying of pipelines. Some municipalities require that they be furnished with liability policies in connection with the existence of such structures as overhead signs and marquees.

Laws of some counties require that a bond or liability policy be furnished in connection with highway crossings.

The laws of the various states are specific in their requirements as to Workmen's Compensation. Disability laws are already in operation in New York, Rhode Island, New Jersey and California, and there is every indication that additional states will adopt this trend. Massachusetts is perhaps the outstanding illustration of a state having statutes in connection with the requirement of Automobile Liability Insurance. Many states have laws with regard to the inspection of elevators. Some states require bonds or liability policies in connection with such construction as highway crossings.

Even the Federal Laws may be involved, where the employer is subject to the U. S. Longshoremen's and Harbor Workers' Compensation Act. A gas company with plant adjacent to any navigable water may require this coverage if, under any circumstances any employee normally based on land could be injured while working on board a barge or vessel. The mere fact that the employee is ordered not to go aboard the vessel would not save the employer from his obligations under the Law.

The Federal Government also has certain regulations with respect to requiring bonds in connection with certain types of river crossings.

Our second executive obligation is to protect the present and future assets of our corporation. This will involve prudent selection of the types of insurance to be bought; prudent selection of the limits of coverage; prudent selection of a qualified insurer; prudent requirements as to insurance to be carried by independent contractors doing work for the corporation.

Our third executive obligation is to insist upon getting, and then taking advantage of the loss and accident prevention services available to us from our insurance companies. By this, we refer to such items as: the physical inspection of properties, where practical and desirable; the analysis of previous losses by cause; recommendations of the insurance company developed by such analysis; analysis of the recommendations of the insurance company by management, including periodic conferences with the executive engineer of the insurance company; top management cooperation in the carrying out of accident prevention programs.

Our fourth executive obligation is to keep insurance costs down without sacrificing protection or service. Briefly we have in mind such items as:

Term discount—Various types of casualty insurance contracts can be written

Condensation of remarks presented at insurance discussion meeting during 1950 A. G. A. Convention.

with discounts of as much as 16 2/3 per cent, if written for a term of three years.

Overtime and payroll limitation—The compensation and many public liability policies are written on the basis of a payroll rate applied to the payroll for certain classifications. The Overtime Rule to which we refer makes provision for the reduction or elimination of the overtime bonus increment in payrolls. The Limitation Rule provides for the limitation of the payroll of any single employee to an average of $100 per week. Unfortunately, the cost of maintaining payrolls in conformity with these rules is often prohibitive.

Retrospective rating—This is insurance terminology for "cost plus" insurance under which the final earned premium for the policy is made up of a carrying charge for the insurance company plus the actual incurred losses multiplied by a loss handling factor. The sum of these two items is multiplied by a tax factor. The premium thus obtained is subject to a minimum premium and a maximum premium.

While this form of rating has been used principally in connection with Workmen's Compensation in recent years, it is now available as respects Comprehensive Public Liability and Comprehensive Automobile Liability, or a combination of all three, in some states. Generally speaking restrospective rating is not likely to prove advantageous unless the Compensation premium is of the magnitude of $15,000 or greater.

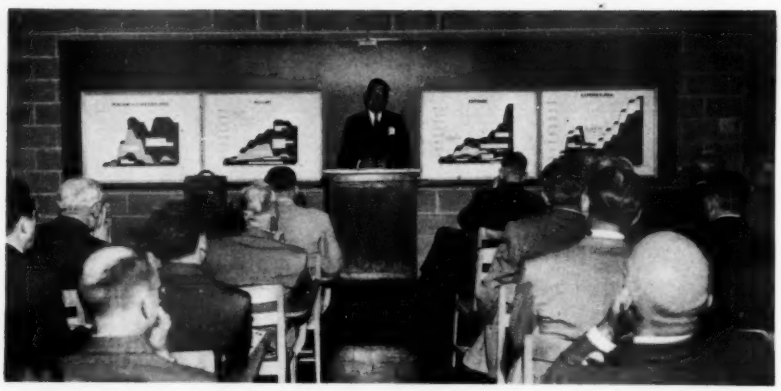
Experience rating—In connection with Compensation, Public Liability and Automobile Liability we have what is known as experience rating. This is a rate modification applicable to the particular Insured in the form of a percentage charge or credit based on the actual loss experience of the Insured. Thus, the premium reflects past experience so that a safety-minded, loss-conscious organization enjoys lower insurance costs in the long run.

Payroll classification—Workmen's Compensation, and in some instances Public Liability, is written on a payroll basis. As there is a tremendous variation in rates, it is extremely important to make certain that payrolls are properly classified.

Verification of loss reserves—Major loss reserves used in the promulgation of experience rating modifications, as well as in developing final premium under retrospective rating plans, should be verified.

Centralized (Continued on page 33)

IGT dedicates new building in Chicago



Frank H. Lerch, Jr., president, Consolidated Natural Gas Co., addressing annual meeting of Institute of Gas Technology. Mr. Lerch was reelected chairman, Board of Trustees

CONTRIBUTIONS of the Institute of Gas Technology to the utility gas industry and the nation's economy were outlined November 2 at the ninth annual meeting. More than 50 leaders of the industry were present.

Highlight of the meeting was the dedication of the Institute's new $900,000 building in an address by Frank C. Smith, president, Houston Natural Gas Corp., and first chairman of the board. Other feature events included election of officers and the annual report of Director Elmore S. Pettyjohn.

In his review of progress, Mr. Pettyjohn reported that the Institute has completed and moved into its $900,000 laboratories on the Illinois Institute of Technology campus. Of the more than $500,000 required for the building, $472,708 has been paid or subscribed by 196 gas companies, he said.

"Stress in equipment and research to date," Mr. Pettyjohn reported, "has been directed toward increased service by improving products through new or improved processes.

"The first problems were to accommodate the expansion in the postwar period and the seasonable demand. The former is being accomplished by the extension of transmission mains, and the latter has been and is being overcome by the conversion of oil to substitute natural gas.

"Use of natural gas has permitted a doubling of the thermal carrying capacity of distribution systems, enabling the gas companies to substantially increase their service with only a nominal increase in investment.

"The immediate problem is the increase of service through improvement of distribution systems. A calculator to develop a method for computing pressure drops to locate restrictions and to limit replacement or extensions to a minimum is now being studied."

In his dedication address, Frank C. Smith reviewed the history and accomplishments of the Institute. "Seventy research projects have been completed by the Institute for member companies and related interests, and 31 projects have been undertaken for American Gas Association," he declared. "Of the latter, 21 have been completed and ten are current. Twenty basic projects have been sponsored by the Institute itself, nine of which are in progress.

"To date 76 men, selected graduates of accredited colleges and universities, have received education at the Institute. Two doctor's degrees and 19 master's degrees have been awarded. The student body at present numbers 31."

Officers reelected were: Frank H. Lerch, Jr., president of Consolidated Natural Gas Co., chairman of the board of trustees, and Raymond J. Spaeth, secretary-treasurer. Dr. Henry T. Heald, president of Illinois Institute of Technology, serves as IGT president.

Trustees reelected for an additional three-year term were: Frank H. Adams, president, Surface Combustion Corp.; Walter C. Beckjord, president, The Cincinnati Gas & Electric Co.; Alexander M. Beebee, president, Rochester Gas and Electric Corp.; Thomas Drever, chairman of the board, American Steel Foundries; N. Henry Gellert, president, Seattle Gas Co.; John L. Holloway, president, Crane Co.; N. C. McGowan, president, United Gas Pipe Line Co.; Frank C. Smith, and Harry K. Wrench, president, Minneapolis Gas Company.

James S. Moulton, vice-president and executive engineer, Pacific Gas and Electric Co., was named to replace H. L. Farrar, president, Coast Counties Gas and Electric Co., whose resignation was accepted.

Two new members of the board's executive committee are: James D. Cunningham, president, Republic Flow Meters Co., and James F. Oates, Jr., chairman, The People's Gas Light and Coke Company.

Other members of the executive committee reelected are: Frank H. Adams, Alexander N. Beebee, Thomas Drever, Frank C. Smith, and Wilfred C. Sykes, chairman of the executive committee of Inland Steel Company. Frank H. Lerch, Jr., and Dr. Henry T. Heald complete the executive committee.

We should re-study the basic principles upon which free society rests

Freedom through truth in action

By ARCH N. BOOTH

Executive Vice-President
U.S. Chamber of Commerce
Washington, D. C.

The sad part of the present world situation is that while our American way of life is being threatened from the outside, it is also being threatened in a far more serious way from within our own borders. Our personal freedom is being threatened by the present sharp trend in this country toward collectivism, welfarism, state socialism—call it what you will.

Unless we stop this trend, we will lose via the back door the very things we are ready and willing to go to the ends of the earth to protect.

When you have socialism—government ownership and management—you have government control and coercion. When you have government control and coercion, you lose your personal freedom. You are then no better off than you would be if some foreign power invaded the land and set up a new form of government, depriving you of your freedom.

This is the lesson history has taught, and may teach again if we are not vigilant.

The real reason we are getting socialism is that a number of powerful groups, with an insistent desire to benefit themselves, are thrusting it upon us.

Let us see who and what these groups are. They include: (1) The communists, both inside and outside the country; (2) certain labor leaders (not all labor leaders); and (3) above all, the controllists, the social-planners, in high positions in the Government.

Our economic success hampers the progress of communism. Hence the communists want to cripple our productivity. Their aim is to bankrupt America. A good way for them to do so, they figure, is to keep our Government spending beyond its means.

Closer home, why are certain labor leaders in this country propagandizing against our American economic system, spreading false information, and otherwise helping bring about state socialism and more government control?

Mr. Booth citing importance of showing employees how business system works

When all is said and done, the labor leaders really do not want Socialism in America. They would rather have free enterprise with the many advantages private ownership offers the worker. But they keep sniping at business and at management to make themselves look important in the eyes of their rank-and-file members.

Most unions in America, thank goodness, believe in the American system, and are not against it.*

Let me say with emphasis that we who are interested in developing a better understanding of the American economic system are not fighting labor. Management and labor must be a team. If one falls, both will fall. We must give employees a sense of accomplishment, and a sense of importance—the greatest driving force in the world.

But by far the most powerful force back of the push toward Socialism in America are the social-planners, the controllists, who sit in high places in the Government, everlastingly devising costly socialistic schemes and striving to put these schemes into effect.

There are three types of controllists:

First, there are the idealists. They want *their* conscience to be *your* guide.

They passionately believe (if we are to believe what they tell us) that the way to set up a perfect social order is by making the Government the supreme master of the individual—the supreme controller of your education, your home, your medical care, your job, your pension—for your own good.

The second type of controllists are the experimentalists.

They recognize, as we do, that our present economic system is not faultless.

But instead of trying to correct the faults, and to go on from there, they want to throw the whole system out of the window. They want to replace it, experimentally, with an entire new system of their own devising just to see if their new system will work.

The third type of controllists in the Government are the bigger-and-better-job boys. They want increasing authority. They want billions of dollars to spend. They want the personal satisfaction of putting their ideas across in a big way—at your expense.

The advocates of socialism have a working blueprint. They plan to move against one industry after another. They

Excerpts from address before general session at 1950 A. G. A. Convention.

* Ed. Note: See "Labor's Case Against Public Ownership," Reader's Digest, November 1950, p. 137.

Old Stove Round-Up in full swing

Success stories and illustrations from the Old Stove Round-Up (a PAR activity) are pouring in from many sections of the country. Shown above is a display of The Philadelphia Gas Works Company featuring a liberal trade-in inducement to get worn out critters out of circulation

seek to weaken their opposition by traveling one important mile at a time.

The first mile is that of creating public misunderstanding. Through subtle propaganda, these minority groups seek to undermine public confidence and to promote misunderstanding of business. From this springboard, when the timing is opportune, they will launch their direct drive against that industry which has become most vulnerable for socialization.

The second mile is that of defeatism. Take, for example, the situation of the utilities in some sections of the country. The leftist propaganda drive against the utilities has already gone so far as to cause many persons to accept complete socialization of the utilities as inevitable.

This defeatist resignation is a strategic goal. Leftist groups know that defeatism feeds itself and spreads rapidly.

The third great mile to be traveled is that of undermining management.

As I said, reflections are cast against private industrial management, its policies and operations. By innuendo and direct attack, public confidence in management is weakened.

To travel down these tragic miles of creating public misunderstanding, promoting defeatism and weakening the confidence of the public in business management, the leftist groups also have certain strategies which they employ with highly skilled efficiency.

The first thing they do is to lull the progressive business people of the country into a false sense of security.

They count on winning persistence.

Another trick they depend on is the utilization of uncountered propaganda. In other words, tell lies often enough and the lies become accepted as truth.

The final trick which the leftist groups rely on is the utilization of a militant minority.

These social-planners, these controllists, are not without encouragement. They are, in fact, encouraged and abetted in their planning and maneuvering by the present attitude of the people.

The great fallacy of 1950 is the growing belief that you can get something (and especially security) for nothing—from Federal Government. You cannot.

Whatever the Government spends must be taken away from individuals—and from the communities in which the individuals live. The Government has no money of its own. All the Government has is what it gets from you and from the other taxpayers.

But many people fail to recognize this.

While giving our full attention to the winning of the war, and our all-out support to the Armed Services, we must, at the same time, guard our country against the threat from within.

We have learned from past experience that the controllists in the Government are always willing to use any national emergency as an excuse to promote their own ends. We must guard against that.

We must scrutinize every piece of proposed wartime legislation to make certain that it is not one of the controllists' pet projects in disguise.

I like your slogan—"Gas—the flame of progress."

But you men and women in the gas industry should never forget that the controllists, the social-planners, the self-seekers in our land also have a *flame*. They have the flame of the zealot—and they use every opportunity that comes their way to fan that flame.

They are not above using the present war as an emergency, an excuse, for putting their socialistic schemes into effect.

What are we going to do about it? Are we drowsily going to wait for the omnipotent state to take over?

There are a number of things which I believe everyone of us can and should do.

First of all, each one of us should make it his business to know how and why a free society works.

As true liberals, having as our objective the genuine improvement of the well-being of the people, we should take time to re-think the basic principles upon which a free society rests—and then check the wisdom of all legislative proposals against those basic principles.

This will help us burn into our souls a proper philosophy about our country and our freedom.

It will give us an unshakeable conviction as to why our American way of life should be continued—and further improved—not cast aside for a system which has proved inferior wherever and whenever it has been tried.

Second, we should avoid adding any coals to the socialist fire. We should make no demands on the Government to do something for us, or for our community, which we can do for ourselves.

Third, we should be active politically.

This is the time for renewed political and citizenship vitality. Right now the need is an all-time high for all of us to meet our full responsibilities as citizens.

Our job today is to work for a united nation. Our job is to support the efforts toward world peace which our Government is making.

That does not mean that we must surrender our rights to control and run our Government *(Continued on page 47)*

Appliance demonstrations test methods of supplementing natural gas

Milwaukee studies standby gases

By E. C. BRENNER

Vice-President of Operations
Milwaukee Gas Light Co.
Milwaukee, Wis.

Arrival of natural gas in the Milwaukee area brought with it the problem of providing a standby gas to be used in the event of an interruption in natural gas supply. Coke oven gas, carburetted water gas and LP-air gas production facilities, which had provided the manufactured gases previously distributed, were available to provide standby gases. It remained to determine whether these gases, or modified gases produced in the plants, could be utilized satisfactorily as a substitute or standby gas by consumer's appliances.

A decision was made to set up a special utilization laboratory for this purpose. Discussion of the problem with the staff of our associated company, Michigan Consolidated Gas Company of Detroit, disclosed that they were in the process of setting up such a laboratory at their River Rouge Plant to solve a local problem. Burners and equipment were chosen typical of equipment in actual use in the Milwaukee area. Where applicable, the appliances were equipped with velocity reducing orifices and otherwise modified as were consumers' appliances in the recent conversion to natural gas. Included were burners which were known to be difficult to operate satisfactorily with substitute gases. Figures 1 and 2 show the floor plan of this laboratory and the appliances selected.

A series of demonstrations were performed to show the extent to which substitute gases are interchangeable with natural gas of 1,010 Btu, 0.685 specific gravity, and generally described as "low methane-high inert" natural gas.

Substitute gases employed were:

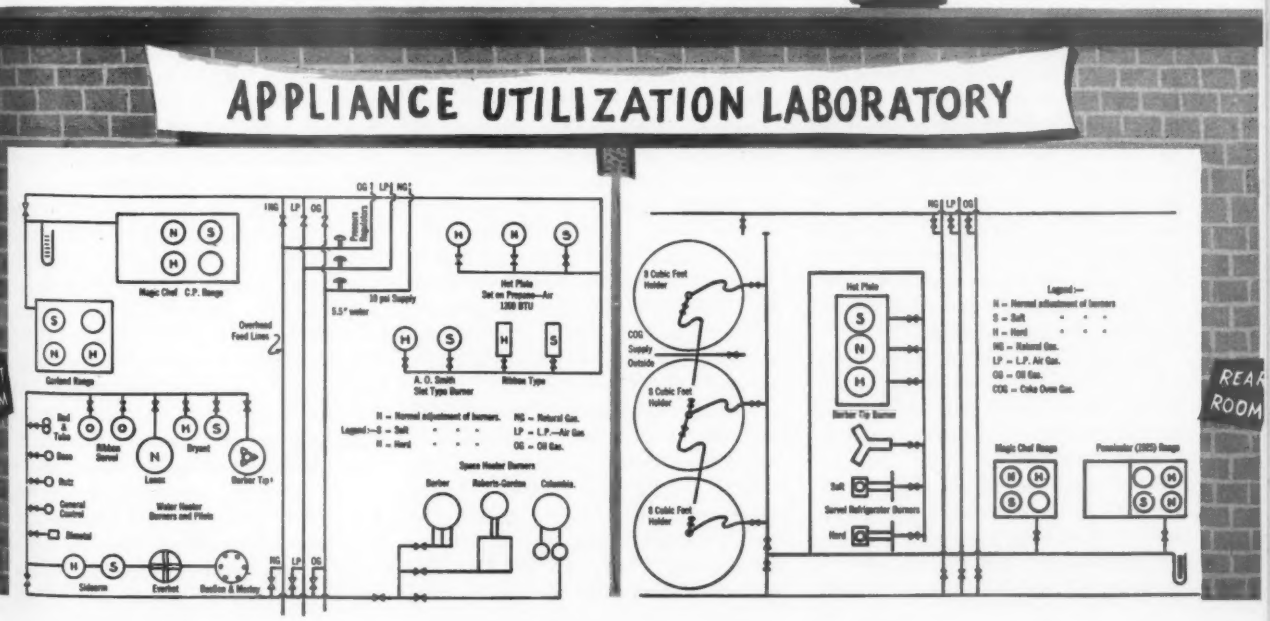
(1) Oil gas of 910 Btu, 0.70 specific gravity
(2) Propane air gas of 1200 Btu, 1.244 specific gravity
(3) Coke oven gas of 540 Btu, .40 specific gravity.

The performance of these gases was demonstrated, both as single component gases and as mixtures, on the appliances shown in Figures 1 and 2.

Selection of an interchangeable gas is not a simple one. "Gaseous Fuels Hand Book"[1] states, "Even a brief consideration of the factors related to the study of the combustion characteristics of a fuel gas reveals that the property is not one

Paper presented before Operating Section during 1950 A. G. A. Convention in Atlantic City, N. J., October 2-5.

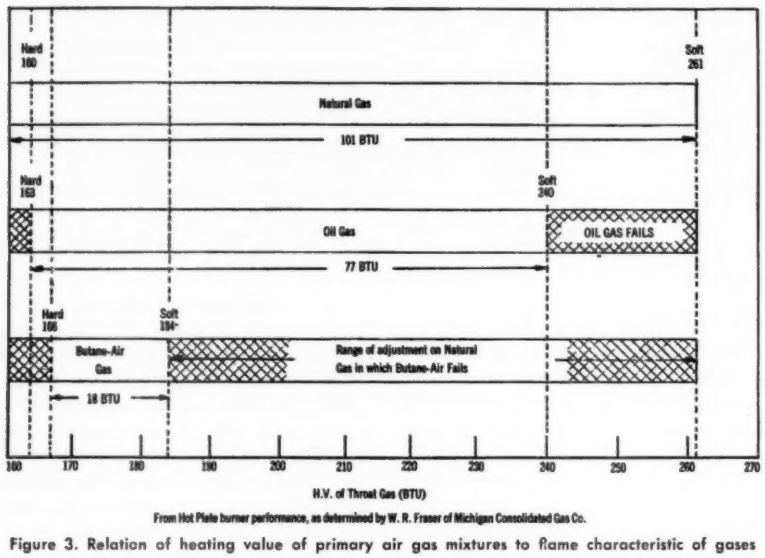
Figures 1 and 2. Floor plans of Michigan Consolidated laboratory and appliances selected for testing



which can be readily defined and measured. The physical and chemical properties of the gas before it is burned, as well as the corresponding properties of the resulting combustion products, enter into the problem, as does the type and design of the burner, and even the properties of the atmosphere in which the combustion takes place. It is significant to find that no one has yet been able to define an acceptable unit which is readily obtainable and universally applicable as a measure of the combustion characteristics of a fuel gas, such as might correspond to the generally accepted heating value."

a definite volume of air required per unit volume of gas, if complete combustion is to be obtained. The volume of air required will vary with the chemical composition of the gas, e.g., 9.6 cubic feet of air are required to burn one standard cubic foot of methane, while 23.9 cubic feet of air are required to burn one standard cubic foot of propane.

The remainder of air required for satisfactory combustion is supplied by the atmosphere surrounding the flame and is called "secondary air." Both primary and secondary air are expressed as percentages of total air required. An excess of



From Hot Plate burner performance, as determined by W. R. Fraser of Michigan Consolidated Gas Co.

Figure 3. Relation of heating value of primary air gas mixtures to flame characteristic of gases

Another quotation from the same source states[2] "It is usually necessary for each gas company, investigating the possibility of beginning of changing its practice of blending gases to make a careful analysis of its own local situation independent of the practice of other companies. The correct and practical solution of individual production problems depends on the capacity to employ the raw materials and the production facilities available in a manner that will result in satisfactory as well as economical gas service to the customers depending on it as a daily necessity."

To understand the principles underlying appliance performance, it is necessary to understand the principle of operation of a simple atmospheric gas burner, such as a Bunsen burner.

In an atmospheric burner, part of the air required for combustion is premixed with the unburned gas before it reaches the burner ports. This air is called "primary air." It is recognized that there is air over theoretical requirements is usually required to eliminate any possibility of carbon monoxide being present in the products of combustion. The flame resulting from a premixture of air and gas differs from a nonaerated flame in that it has two distinct cones. The size and shape of the flame depends upon the percent of the total air required which is supplied as primary air; it will range from a lazy, luminous flame (called "soft"), with little or no primary air premixed, to a flame with a very short, bright blue inner cone that may be noisy, tend to flash back, or lift, when a large percent of primary air is provided. The latter is referred to as "hard."

A third classification is termed "normal" and its appearance lies between the extremes of hard and soft. On a customer's premises, hard flames are considered tolerable if they do not lift, emit excessive noise or flash back. Soft flames are tolerable if there are no yellow tips present. It is estimated that, of the total number of consumer's burners served by a utility, ten percent approach the tolerable limits of hard adjustment, 15 percent approach the tolerable limits of soft adjustment and the remaining 75 percent are normal. Burner adjustment tends to shift to the softer setting through use because of accumulation of grease and lint in the air shutter openings.

The gas on which a burner is adjusted to obtain any particular setting was termed "adjustment" gas. In the demonstration to follow, natural gas was the adjustment gas with but one exception. Any gas subsequently admitted to these burners was termed a "substitute" gas.

It has been determined that the input rate to a burner bears a relationship to two readily measured quantities: specific gravity, and heating value. The rate of flow through an orifice expressed in Btu per hour varies directly with the heating value (h) and inversely with the square root of the specific gravity (d). For equal input of two gases on the same burner this is expressed mathematically as $\frac{h_a}{\sqrt{d_a}} = \frac{h_s}{\sqrt{d_s}}$ where the subscripts (a) and (s) refer to adjustment and substitute gas respectively. In utilization demonstrations, as here considered, discrepancies between calculated and observed results are within the limits of experimental error, particularly so since viscosity and other minor factors influencing gas flow are omitted.

Primary air injection bears a relationship to specific gravity and heating value. The primary air factor is expressed mathematically as $\frac{1000\sqrt{d}}{h}$. The constant 1000 is employed to eliminate zeros between the decimal point and the first significant digit. Neglecting pressure, it is evident that the primary air factor is the reciprocal of the input rate.

Two gases, possessing the same constants should inject the same quantity of air and have the same input rate. This condition of equivalency leads to an assumption that the two gases are interchangeable on all appliances. In practice, this assumption is in error because it neglects ignition velocity. Experimental data indicate that no two commercial gases will have the same ignition velocity or speed of flame propagation. This fact accounts for the difficulty in predicting the behavior of a substitute gas and makes it necessary to test each gas for interchangeability. Fast burning constituents of a gas tend to increase ignition velocity and

have a tendency to flash back and be noisy on extinction. Such constituents are hydrogen and acetylene. Slow burning constituents such as methane or "illuminants" decrease the speed of flame propagation and may result in lifting or "blowing off" of flames.

A secondary fallacy in the assumption of interchangeability based on equivalence of input and primary air injection rate is that of total air requirements. Two gases having the same heating values and specific gravities do not necessarily require equal amounts of air for complete combustion.

It is because of the foregoing reasons that formulae, such as the Knoy formula, Constant $C = \frac{h - 175}{\sqrt{d}}$, fail when applied to high heating value gases. Latitude under this formula when using low heating value gases is misleading because of the similarity in chemical composition of those gases.

As an example of the inadequacy of the Knoy formula in this respect when applied to high heating value gases, a 1,400 Btu butane air (specific gravity 1.44) was compared to natural gas (adjustment gas) having a heating value of 970 Btu (specific gravity of .68). Applying these values in the formula, and calculating the constant for each gas, the value C for natural gas = 945 and for propane-air = 1,020.

Generally, the Knoy formula permits deviation of ten percent for interchangeability. The actual deviation of C for this butane-air gas from C for the adjustment gas is 7.9 percent. It would seem therefore that no difficulty should be encountered in substituting 1,400 Btu butane-air gas for natural gas. To show how well it actually did, let us consider the information supplied in Figure 3.

In presentation of this data, Mr. Fraser showed the heating value of burner throat gas (primary-air gas mixture) at the tolerable limits of hard and soft settings as a means of evaluating the utilization ranges of natural gas and substitute gases. The data was obtained from performance of a simple hot plate burner.

	Btu Heating Value of Primary-Air Gas Mixture		
	Soft	Hard	Utilization Range
Detroit natural gas	261	160	101
Oil gas	240	163	77
1,400 Btu butane-air gas	184	166	18

This data graphed on horizontal coordinants will serve to emphasize the relative utilization ranges. The overlap in respective ranges shows the area in which satisfactory operation may be expected from an interchange of gases. Referring to the graph, it can be seen that butane-air will burn with an intolerable yellow flame on a burner adjusted for natural gas, when air shutter adjustments produce a throat gas in excess of 184 Btu. In the narrow range on the left, when the throat gas of the butane-air is less than 166 Btu, it will burn with excessive hardness. This data therefore indicates that the Knoy formula cannot be relied upon for predicting interchangeability of high Btu gas. Demonstration of appliance performance in the utilization laboratory confirms the basic information provided by this graph.

The graphical data and utilization demonstrations also show that little difficulty is encountered when natural gas is burned in an appliance adjusted on LP-air gas. This can be anticipated by inspection of the graph. It will be seen that the limit of the hard and soft adjustment of LP-air falls well into the tolerable range of natural gas adjustment.

In reporting the results of these demonstrations the terms "intolerably hard," "intolerably soft," "yellow tipped," "flash back," and "lifting" have been used without any explanation why these forms of behavior are undesirable. Any of these burner characteristics can result in a customer complaint simply because there has been a deviation in performance from that to which the customer has been accustomed. The following explanations may be helpful:

(a) *"Lifting"*[3]—When the velocity of an air-gas mixture, normal to the inner cone surface at the ports of an atmospheric type Bunsen burner, exceeds flame speed of the particular gas mixture, the flame will lift or blow off the ports. If the velocity is increased a point will be reached when the flame will be extinguished. Escaping gas from an unlit burner is dangerous. Lifting of flames from ports is undesirable because it usually indicates that the gas is only partially burned. This is especially true when a cold utensil is placed over such a burner. Ignition of gas in mixtures at or above the lifting limit is difficult, and flame travel from port to port is unreliable. Efficiency of utilization is below normal.

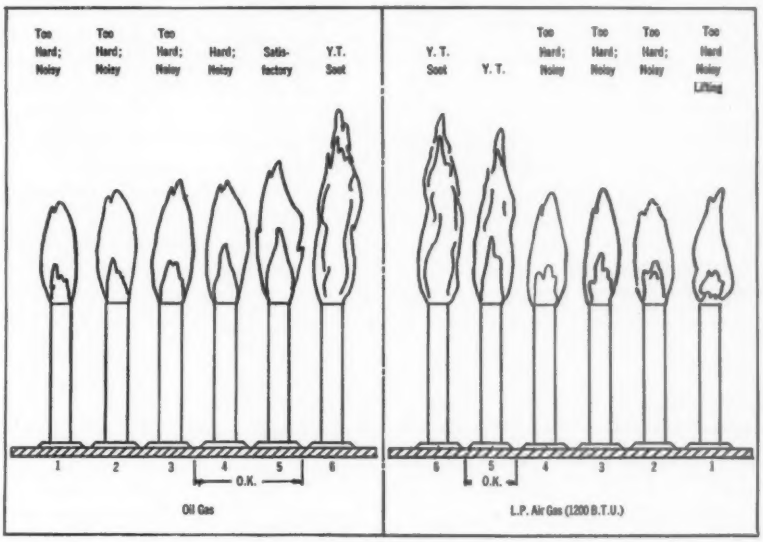


Figure 4. Performance of oil gas and LP-air gas on Bunsen burners adjusted on natural gas

(b) *Appearance of "yellow tips" in flames*[4]—Formation of yellow tips in flames is probably due to thermal cracking in the gaseous phase of the heavier hydrocarbons, resulting in incandescent carbon particles. Yellow tips are undesirable; they signal the deposit of soot on the heating surfaces. This results in a decrease of heat transfer, necessitating cleaning. Carbon deposits at pilot burner can cause outage. Because blue flames are usually much shorter than yellow flames for a given gas input rate to a burner, the distance between burner and heat transfer surface is less than for a yellow flame. Appearance of yellow tips may therefore

APPENDIX I—DATA OF DEMONSTRATIONS OF APPLIANCES IN FRONT ROOM

	Adjust Gas	Supplemental Gases	
	Natural Gas	Oil Gas	LP (Propane) Air Gas
Magic Chef			
Soft	OK	Merging Yellow	Yellow Tip
Normal	OK	Yellow Tip	OK
Hard	OK	OK	Short Cones
Garland			
Soft	OK	Merging Yellow	Yellow Tip
Normal	OK	OK	OK
Hard	OK	OK	Poor Ignition
Water Heaters			
Side Arm			
Soft	OK	Merging Yellow	Yellow Tip
Hard	OK	Trace Yellow	Trace Yellow
Everhot	OK	Yellow Tip	Slight Yellow
B & M	Noisy	Noisy	Very Noisy
Servel			
Soft	OK	Trace Yellow	Sharp
Hard	OK	Shorter Flame	Very Short Flame
Bryant			
Soft	OK	Yellow	Yellow Tip
Hard	OK	OK	Lifting
Barber	OK	Flashback	Flashback
Pilots			
Bimetal	OK	Yellow Tip	Yellow Tip
General Controls	OK	OK	Yellow Tip
Rutz	OK	Luminous	Luminous
Baso	OK	Yellow Tip	Yellow Tip
Rod & Tube	OK	Yellow Tip	Lifting
Space Heating Burners			
		Flashback	Flashback
Barber	OK	Some Recovery	Some Recovery
		Flashback	Flashback
Columbia	OK	No Recovery	No Recovery
		Flashback	Flashback
Roberts Gordon	OK	No Recovery	No Recovery
Janitrol (Ribbon Burner)	OK	OK	OK
A. O. Smith (Ribbon Burner)			
Soft	OK	OK	OK
Hard	OK	OK	Lifting
Hot Plate (Set on L. P.)			
Soft	OK	OK	OK
Normal	OK	OK	OK
Hard	OK	Sharp	OK

cause impingement of the flame and incomplete combustion, with a resultant release of carbon monoxide into the atmosphere. Carbon monoxide is probably an intermediate product in the oxidation of a hydrocarbon. Time and temperature are factors in the oxidation of CO and CO_2 If the flames are caused to impinge on a cold surface, this reaction is arrested before equilibrium is reached and some CO will escape to the atmosphere.

(c) *"Flash Back"*[5]—When the velocity of the primary air gas mixture falls below velocity of flame propagation, the flame will flash back through the burner port. Tendency to flash back varies with the type of fuel gas, port size, port depth, primary air, gas input rating, and temperature of ports and air gas mixture. In any burner operation, flash back must be avoided. The most undesirable results of flash back are the generation of products of incomplete combustion, objectionable odors, sooting or clogging of burners and orifices, and damage due to overheating of burners. In actual practice, the increase in appliance service complaints resulting from substitute gas distribution is the controlling factor in the extent of use of such gases.

Experience indicates that 150 to 200 appliance service complaints per million burners (.015 to .020 percent of the burners) per day can be considered normal for natural gas systems. Service departments generally are organized to effectively meet this complaint rate. Should something occur to raise the ratio to 0.1 percent of the burners served by the utility, the result would be a 500 to 600 percent increase in complaints. Such numbers could probably be handled for a short period, but the service department would soon be at the limit of its facilities.

Should the ratio increase to 1.0 percent this would approach 10,000 complaints per day per million burners. Obviously no company can afford to provide a service organization to meet that number of daily complaints. Substitute gas operations must be conducted in a manner to prevent such an occurrence.

The effect of substitute gases on leak complaints is another significant factor. In Detroit, the introduction into the distribution system of a gas having a different odor than natural gas, increased leak complaints about 600 percent over a period of four days. This was not because of new leaks caused by the substitute gas but because the odor differed from that to which the customers had become accustomed.

In actual practice therefore, the choice of any substitute gas must be such that the increase in appliance adjustment complaints will keep the combined complaints within a tolerable range.

Description of Tests

A—Demonstration of Bunsen Burner banks

The initial demonstration was performed on a pair of six unit Bunsen burner banks, Figure 4. The burners of both banks were adjusted on natural gas in gradations from maximum hardness to a soft flame that showed traces of yellow tips.

First step of the demonstration was to show this adjustment by admitting natural gas to the manifold of both banks. In step two, oil gas was admitted to the left manifold and LP-air gas to the right manifold. Two burners, No. 4 and No. 5, of the left bank operated satisfactorily on the oil gas but only one burner, No. 5, operated satisfactorily on LP-air gas; thus showing that straight oil gas has a wider range of utilization than straight LP-air gas. This is the condition shown in Figure 4.

For step three, burners at the left bank operating on oil gas, and the burners of the right bank operating on LP-air gas were adjusted to a graduated flame characteristic adjustment similar to the original adjustment on natural gas. Then natural gas was again admitted to the manifolds of both burner banks. All 12 flames were nearly identical in flame characteristics and operated quite satisfactorily. The flames generally tended towards a soft adjustment, but were without trace of yellow. The demonstration of step three shows that appliances adjusted on substitute gases will operate

quite well on natural gas; hence natural gas is a good substitute gas for oil gas and for LP-air gas. Step two shows that the sequence cannot be reversed; hence oil gas and LP-air gas are not good substitute gases for natural gas.

After this demonstration the Bunsen burner banks were again adjusted on natural gas to prepare the apparatus for succeeding portion of the demonstration.

B—Demonstration of appliances in front room

The appliances for this portion of the demonstration consisted of the following:

(1) *Magic Chef CP range*—a new appliance equipped with natural gas burners.

Three top burners were adjusted on natural gas to hard, normal and soft settings. The fourth burner was adjusted normal on LP-air gas. The oven burner was adjusted soft on natural gas.

(2) *Garland range*—Three top burners were adjusted on natural gas to hard, normal and soft; the fourth burner was adjusted normal on oil gas. The oven burner was adjusted on natural gas.

(3) *Space heating burners*—Two burners, the Columbia and the Barber unit consist of multiple fixed Bunsen type burners.

The Roberts Gordon was adjusted soft on natural gas.

This portion of the demonstration was arranged to show the effect of oil gas and LP-air gas on appliances adjusted on natural gas. The Magic Chef (CP) range was the first appliance to be tested. Natural gas was supplied to show the burner adjustment and give the observer a basis of comparison. Then without causing any decrease in gas supply, oil gas was turned on and natural gas supply shut off. The result was that the hard flame shortened slightly but was still considered tolerable; the normal flame became softer but remained satisfactory; the soft flame changed to luminous and sooting, and the oven flame remained satisfactory. The gas supply was then switched from oil gas to LP-air gas in the same manner and the effect on burner operation noted. The hard flame became very hard and green in color; the normal flame acquired yellow tips and the soft flame became intolerably luminous and soot forming. The oven flame remained satisfactory. This range had a fourth burner adjusted normal on LP-air gas. It gave satisfactory performance on all three gases.

Supplemental gases were next demonstrated on the Garland range. Natural gas was admitted for comparison purposes and then the switch made to oil gas. The hard burner became slightly harder but could be considered tolerable; the normal flame was completely satisfactory; and the soft flame acquired yellow tips which was soot forming, intolerable, and a potential source of customer complaint. The oven flame showed traces of yellow tips. The fuel cocks were again manipulated, this time to admit LP-air gas. Some difficulty was experienced in igniting gases on the hard burner. The normal flame acquired a trace of yellow tips and the soft flame became luminous and soot forming. The burner adjusted normal to oil gas operated satisfactorily on all three gases. The oven which had been adjusted to soft showed considerable yellow and produced an offensive odor.

The Columbia burner was the first space heating burner tested. Because of its characteristic, the flash back of this burner can be used as a criteria for substitute gas performance in space heaters. The burner was supplied with natural gas and numerous unsuccessful attempts were made to cause it to flash back. When the gas supply cock was throttled to a nearly closed position, the low flames became luminous but did not flash back or burn in the spud. Low velocity gas jets from burner orifices lose their ability to inject primary air; *(Continued on page 39)*

APPENDIX II—DATA OF DEMONSTRATION OF APPLIANCES IN REAR ROOM

	Adjust Gas			Supplemental Gases							* Odor
				(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
	Nat. Gas	Oil Gas	LP (Propane) Air Gas	30% Oven 70% Nat.	35% Oil 65% Nat.	25% LP 75% Nat.	30% Oven 70% Oil	50% LP 50% Oven	50% LP 50% Oil	20% LP 35% Oil 45% Nat.	11% Prop. Va. 30% Oil 34% Oven 25% Nat.
Btu	1010	910	1200	866	976	1058	798	868	1055	1014	987
Sp. Gr.	.685	.70	1.244	—	.691	.825	—	.832	.972	.802	.802
Hot Plate											
Soft	OK	Y. Tip	Y. Tip	OK	Y. Tip	Y. Tip	OK	Y. Trace	Y. Tip	Y. T. Trace	Y. Tip
Normal	OK	Y. Tip	Y. Tip	OK	OK	OK	OK	Sharp	OK	OK	OK
Hard	OK	OK	Sharp	OK	OK	Sharp	Ext. Noise	Flashback	Short	Sharp	Sharp
Electrolux											
Soft	OK	Y. Tip*	Y. Tip*	OK	Y. Tip	Y. Tip	OK*	OK	Y. Tip*	Y. Tip	Y. Tip
Defrost	OK	Y. Tip	Y. Tip	OK	Y. Tip	Y. Tip	Y. Tip	Y. Tip	Y. Tip	Y. Tip	Y. Tip
Hard	OK	OK	Squirting	OK	OK	OK	Sharp	Squirt	Squirt	OK	OK
Defrost	OK	Y. Tip	Y. Tip	OK	OK	OK	OK	OK	OK	OK	Y. Tip
Barber											
Turn Down	OK	Y. Tip	Y. Tip	OK	Y. Tip	Y. Tip	Y. Tip	OK	OK	Y. Tip	Y. Tip
Flashback	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes
Recovery		Yes	Yes		Yes	Yes	No	No	Yes		Yes
Apt. Size Magic Chief											
Soft	OK	OK	Y. Tip	OK	OK	OK	OK	OK	Y. T. Trace	OK	OK
Normal	OK	OK	OK	OK	OK	OK	Poor Ign	Poor Ign	OK	OK	OK
Hard	OK	Poor Ign	Poor Ign	OK	OK	OK	Ext. Noise	Ext. Noise	Poor Ign	Sharp	OK
Penninsular Range											
Soft	OK	Y. Tip	Y. Tip	OK	Y. Tip	Y. Tip	OK	Y. Trace	Y. Tip	Y. Tip	Y. Tip
Normal	OK	Y. Tip	Y. Tip	OK	OK	OK	OK	OK	Y. Tip	OK	OK
Hard	OK	OK	Sharp	OK	OK	Sharp	Sharp	Sharp	OK	OK	Sharp

● *Supervisors, key men in the company's communications chain, must be trained*

Standard Oil Co. (N. J.)

Tune to employee wave lengths

By ESKIL I. BJORK

Vice-President
The Peoples Gas Light & Coke Co.
Chicago, Ill.

My subject is communication in industry—communication between management and the organization in order to supplement other measures and weld the organization into an informed, understanding, cooperative unit. I welcome the opportunity to discuss this topic because, in my personal opinion, the whole subject of industrial communications programs needs to be taken apart, analyzed, and perfected.

Presented at Accounting Section luncheon during 1950 A. G. A. Convention.

First, however, here are three assumptions to preface the discussion:

(1) We want our business and our company to be successful.

(2) For it to be successful, we must provide the very best utility service that any reasonable customer can demand, at rates that are fair, reasonable, and competitive.

(3) To render that kind of service, we need among other things an organization of men and women working together as a team—a winning team. They must be men and women who are informed about the business and understand the objectives of their labors. They must be in general accord with the methods, practices, and policies which those members of the team who constitute the managers deem necessary or desirable.

It is to one phase of this third assumption that I address these remarks—our need of an informed, understanding, cooperative employee organization. The description itself implies communication. Only through communication can we provide information; only with information can we develop understanding; and only through understanding can we achieve cooperation worthy of the name.

Communication deserves the name only when there is receptivity; when the subject matter is of general interest and the communication can be understood by those for whom it is intended—when management and employees are on the same wave length. The distribution of annual or interim financial reports, employee handbooks, policies, news about significant developments in the company or

industry; meetings for discussion of such matters, are all phases of a communications program. But the performance of these acts by management does not necessarily mean that there has been communication on any significant scale.

It is not enough that we have something to say to our employees. It is equally important to say it so that they can understand it. They may want to read our letters, financial statements, or other communications, but unless these are in forms that are understandable, employees may be unable to read them. I have become convinced that we must do more than we have done to ascertain, if possible, what parts of our programs are effective, what parts may be a waste of effort, and what we can do to achieve greater perfection in our programs. We must tune to the wave length or wave lengths of our employees so that we may more nearly achieve the degree of understanding and cooperation that represents our goal.

I suspect that communications programs are sometimes described as successful merely because the managers devote hours and sweat in their preparation and fall in love with the results of their efforts. I want to know that someone is listening and understanding; that employee attitudes are in some degree affected by the effort. Therefore, the first point I want to make is that we must find some way to ascertain if we are on the proper wave length in our programs—some process of evaluation. Shotgun methods of communication are valid and defensible only while we are actively and intelligently pursuing more effective means and methods. Most companies undoubtedly have the same experience we do so far as getting any concrete evidence of the effectiveness of our communications program—we get practically none except on direct solicitation.

We have several hundred management employees who ought to be concerned, as a primary duty, with the success of the company's program. Most of them are on the firing line where they are in a position to observe or otherwise ascertain if we are on the proper wave length. Whatever observations they make seldom come to our attention. Perhaps they regard the transmitting of information by management a goal in itself, and the receipt of a communication evidence of the attainment of the goal. The evaluation of a communications program, while seemingly simple, is anything but that. The familiar check list or true-false devices will not suffice. True evaluations will come as a by-product of the acceptance by management people of their responsibilities in the field of human relations in industry and in the attainment of two-way communication.

For effective communication, there must be—first of all—an atmosphere of confidence and trust. There must be confidence in top management which originates the communications and is generally responsible for the atmosphere or climate within which our employees perform their jobs; confidence in the other echelons of management who, in the final analysis, are directly responsible for the atmosphere or climate.

It is difficult for employees to have confidence and trust in abstract titles. They want to place their confidence and trust in people—people whom they see now and then and whom they hear now and then. This is far from easy in a big company—in any company.

Employee confidence needed

To see our employees, to talk to them, takes time, and time seems to be the one thing that is in short supply. Top management ought to be more than a signature to a communication; more than a press photo which appears in the newspapers when the financial results for the quarter or the year are announced. Furthermore, top management must give almost constant evidence of its awareness of the employees' desire for satisfaction in their employment relationships.

Surely, for the proper evaluation of a communications program, employees must have confidence in their immediate supervisors—confidence that permits a free exchange of views on any matter affecting the employee and/or the company; confidence which removes the necessity for anonymous communications to the top boss. But we can't expect our supervisory personnel to be effective in the company communication chain unless we give them to understand that they are the key contacts, that they have the responsibility to systematically and regularly transmit information to employees. They must understand that their obligation to do this is an important and continuing part of their jobs. They must understand how to do it.

They must encourage employee reactions, criticisms, suggestions, and expressions of opinion. They must be trained to make their conversations with employees count and to do this in an informal and natural way. They must learn the art of listening. And to complete the chain of communication, they must transmit to others in management, their suggestions, based on observation, for more effective measures in the development of an informed, understanding, cooperative organization. This is a two-way communication in its most important sense.

Now, my second point. We cannot have an effective communications program until we have developed an informed, capable management group whose acknowledgement of their responsibilities in the establishment of good human relations forms the basis for the existence of confidence and creates the opportunities for evaluation. Our supervisory forces are potentially the keys that unlock the doors to our goal of an informed, understanding, and cooperative organization.

It is because of this potentiality that most of us pursue our management development programs. We must not be discouraged if the results we seek seem long in arriving.

Even if we wanted to, we could not stop communicating. Management communicates by example, by what it does, and how it does it. Our use of other media, such as conferences, written material, visual aids, posters, etc., is merely for the purpose of proper interpretation of what we do, or are about to do, for more effective communication.

Someone said, "Your actions are so loud I can't hear what you say." Then there is the old Chinese proverb, "Hear what men say but watch what they do." We communicate by the actions we take in operating the business.

I recall that some ten or more years ago someone in our organization had the temerity to suggest that we express our labor or personnel policy in writing. Two years ago, we did prepare and publish a twelve-point *(Continued on next page)*

personnel policy. On examination, we discovered that it was substantially an expression and explanation of the things we had been doing over the years. In publishing our policy we were merely seeking to communicate more effectively.

Oral communication is the most effective method known. No one has devised a substitute for the conference discussion group as a media for disseminating information. But with respect to a large number of our employees in the gas industry, we face some difficulties in the use of this medium. Our employees are scattered over the territories we serve. Many have jobs which take them out of direct contact with management for most of the day. Some have jobs they can't leave during working hours because the production and distribution of gas brooks no interruption. But if the supervisors are in fact the keys to an effective communications program, we must find ways to overcome these difficulties, and to utilize the conference method.

Then we have the opportunity to communicate in writing—by posting on bulletin boards or by direct distribution to employees at their homes and at their places of work, or their homes in some instances and their places of work in others. Real values are to be had in acquainting the families of our employees with our business, our aims and objectives, and with our efforts to establish a good employment environment. But those who have made a study of the subject tell us that less than half of the American people have developed the reading habit. The percentage is surely much lower in our physical work groups. Knowing how to read does not mean that one reads.

Employee wave lengths

A few years ago, we decided to get out a new edition of our employee handbook. To me, this is one of the most important documents an employee can possess. It is his employment prospectus. If well done, it is a statement of the policies and practices instituted by the managers of the team to assure a winning spirit. It reflects the measures that management has taken to evidence its understanding of employees' needs and desires in order to have satisfaction in their employment relationships, within the limits of prudence. We took great pains in the preparation of this prospectus. We were, in truth, quite proud of the result and eagerly awaited the plaudits of the organization. But, as is usually the case, we virtually had to solicit comments.

About six months after the distribution of our masterpiece, I was in the company of two of our younger shop employees, off the job. Both were high school graduates, veterans of World War II. Both had about five years of service with Peoples Gas. We talked about a lot of things. Finally I got around to inquire if they had read our employees' handbook. Neither had read it, but one professed to be leisurely looking it over at home. Neither of the boys had read the separate booklets we have distributed describing our pension plan, group insurance program, hospitalization plan, etc. I told them that I was utterly amazed—that these booklets, in the aggregate, together with the labor contract, summed up the conditions under which they were employed by us and, as such, ought to be of primary interest to them.

One of the boys said, "Mr. Bjork, you people get out too much written or printed material. Employees don't read." He could just as well have said, "So far as much of this material is concerned, you are not on our wave length."

Some time later, our chairman gave an interview on his employee relations philosophy, which was published in *Partners,* a labor-management periodical. Because of its subject matter and excellence of presentation, we made reprints and sent them to all employees. Shortly afterward, one of our assistant superintendents happened to come to my office and I asked him if the reprint had created any noticeable impression.

"Mr. Bjork," he said, "if you think employees read, you are mistaken." And this, from the assistant superintendent of a department where the level of education is higher than the average, and where there is no question about the ability to read with understanding.

Here were evaluations. Disappointing? Yes, bitterly so! I think we should accept them as a challenge to management to find employee wave lengths.

Communication in industry, I have concluded, is an excursion into the realm of adult education rather than an advertising project. It could be a bit of both. By our efforts, we are seeking to influence the thinking of people, to change attitudes, if need be. In some instances, employees may have fixed opinions on the subject matter of the communication and may have insulated themselves against the acceptance of contrary views. Some may not necessarily be moved by logic. Some may prefer to rely on the grapevine, rather than on official statement—however well phrased. Some may choose to label management communications as propaganda, with the meaning commonly ascribed to that word. Their educational backgrounds differ widely, so does their ability to grasp and understand. Many have not developed reading habits, or they limit their reading to the daily newspapers.

Educational cooperation

So, for my third point, I suggest that industry can profit by utilizing the advisory services of our colleges and universities in the perfection of our communication programs. The people whose business is education and who have, over the years, evolved tested methods and media to influence the thinking of other people ought to have something to offer us in this field. In the area of management development or supervisory training they should be able to perform a valuable function. Furthermore, they ought to welcome the invitation to participate. Here is a real opportunity for public service in the improvement of the environment in which our economy operates. We are presently engaged in a research project with the Industrial Relations Center of the University of Chicago where we shall test the value of such cooperation. As part of our management development program, we embarked on a program to vitalize the responsibility for cost control as a prime function of all supervisory personnel.

It is too early to say how well we shall succeed in developing new attitudes in this important phase of operation. We seem to be making progress. We need have no hesitation in proclaiming that the by-product values of this cooperative effort have been real and tangible. The staff people of the company and the university have gained valuable experience in this project. We have definitely improved our conference leadership. We have discovered the value of supervisory participation in the development of projects. This experience should enable us to become more effective in the whole area of management development.

The need and the value of cooperation between universities, colleges and industry in this area become more convincing as we observe the effort on the part of management of many companies to sell the so-called free enterprise system to employees.

Accounting committees hard at work

ALL the 1950-51 committees of the Accounting Section have swung into their work with a spirit and vigor that augur well for a successful year. Most of the Section's groups have already met with their EEI counterparts. From the discussions at these organizational meetings, the various chairmen and coordinators are well advanced on planning a program for the year's work. Details of this program will be reported in the January issue of A. G. A. MONTHLY. Here is the starting line-up of meetings already held or scheduled.

Taxation Committee held several meetings in Atlantic City during the A. G. A. Convention. These sessions were joint meetings with the EEI Committee, and included not only meetings of an organizational nature, but others to consider the impact of an excess profits tax on the utility industry. The benefits of the committee's deliberations were passed on to the A. G. A. National Defense Committee. This committee, in turn, met with legislative and tax experts of the Internal Revenue and Treasury Departments in a two-and-a-half hour session to present the views of the industry on this subject.

Joint Customer Accounting, Customer Collection and Customer Relations Committees met in Cincinnati on September 21 and 22, 1950. These groups, under the general direction of Cliff Havener, A. G. A. Customer Activities coordinator, and Roy McCrorey, EEI Customer Activities chairman, held discussion and planning meetings that laid groundwork for an instructive and profitable year.

Joint Planning Committee, consisting of the Section chairman and vice-chairmen, coordinators and committee chairmen, held a one-day meeting in New York on October 16, 1950 to discuss over-all plans for the Joint Spring Conference in Chicago, April 23-25, 1951. If their plans materialize, accountants attending the conference can look forward to an unusually interesting general session to start things off on Monday afternoon.

General Accounting, Plant Records, Internal Auditing and Accounting Employee Relations Committees held joint meetings in Cincinnati on October 26 and 27, 1950. Carter Shields, A. G. A. coordinator and Ed Cassady, EEI vice-chairman, promise that fruitful and instructive projects will not be lacking in the programs of these committees.

Materials and Supplies Committee, with no EEI counterpart, will hold a two-day meeting in Columbus, Ohio on December 4 and 5, 1950. Following this session, the Standard Packaging Subcommittee will hold a meeting with manufacturers' representatives at the same place on December 6 and 7, 1950.

A. G. A. Accounting Section Managing Committee will meet for two days at Hot Springs, Virginia on November 16 and 17, 1950. The two days will be largely devoted to discussions of current industry problems. Section Chairman Alan Cullman is confident that the deliberations of this important committee will establish some guide posts that will enable the various groups to plan long-range projects and studies of real benefit to the industry.—*RFM*

No person in top management or in the industrial relations field has escaped the necessity for considering the advisability of embarking on such a program. All about us industries are taking up that chore with enthusiasm and zeal.

As a general rule, these free enterprise projects can be placed in two categories: those which strive to sell the free enterprise system by the mass distribution of attractive booklets and folders extolling the accomplishments of our economic system; and those which profess to impart an understanding of basic economics, usually by the conference method.

The first of these methods I regard as harmless but largely ineffective. It may be questioned if they are worth the price of participation, even though on a per employee basis, that price may be exceedingly low.

As to the second method, I have some hopes and some fears. I hope that such programs may be undertaken without losing the confidence and trust of our employees. I fear that this is not the case.

Why should management be insistent that all employees be better advanced in basic economics? We have a ready answer—a good one. Employees, as a matter of self-interest, should seek to improve their abilities to understand and interpret for themselves the events and trends of today and tomorrow in terms of future impact. Does this objective, worthy as it is, justify an excursion into a field that touches so closely upon the political convictions of our employees, which, you may be sure, are just as deep-seated as our own?

Our employees are no less devoted to our country, no less concerned with its forward progress than we in management. Like us, they are imbued with the desire, if not the determination, to improve their status, to reach higher and higher standards of living, to leave a heritage of freedom and opportunity to their children and children's children. They will be staunch defenders of the economic system which provides them with real values, values that they can feel and experience and not merely read about and hear about.

Wholesome environment

If our system or the foundations of the system, on which rests the future of America, is in real danger, a danger that the citizens of America do not readily perceive then management people cannot meet their obligations to posterity through the process of directing that employees be given a dose of free enterprise.

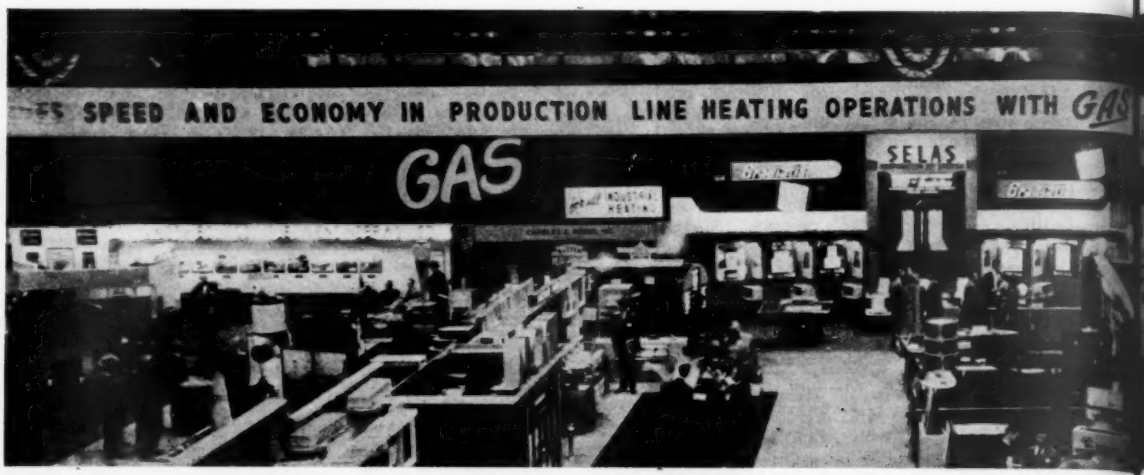
Is not the proper means of eliminating some of these dangers through political action? Is not the proper place to deal with them then in the political arena where they can be approached on a citizen-to-citizen basis and not in our plants and offices on management-to-employee basis? We will be a long time living down a possible charge of using our management-employee relationship, which we ought to prize highly, for purposes not consonant with the basic objectives of that relationship.

Surely, we should sell the so-called free enterprise system, which, by the way, we ought to define more explicitly if we hope to make a sale. We must pursue our proper function of striving to create a wholesome environment in industry that will bring real satisfaction to employees in their relationships with us. At the same time we must so conduct our business as to give public evidence of our obligations to our society; give some of our time to the problems of our communities to help create a greater sense of satisfaction in the art of just plain living. If we do these things we shall be most likely to succeed in selling our economic system. We can't expect employees to find satisfaction with an economic system that fails to provide them with satisfaction in their employment relationship.

Do we have a chance of establishing a sense of work satisfaction? Will the desires and demands of employees develop more rapidly than the ability of the economic system to satisfy them? I think the answer is "yes." There will always be unsatisfied demands—one of the essentials to progress in our economic system. The desire on the part of our employees to improve their status is one of the impelling incentives to economic progress.

Perhaps we have reached the stage in our economic life where there needs to be—generally *(Continued on page 36)*

CARL H. LEKBERG, *CHAIRMAN* • RONALD A. MALONY, *VICE-CHAIRMAN*



This huge sign, visible from all points in the Metals Show arena, provided an impressive backdrop for American Gas Association's Combined Industrial Gas Exhibit. Part of the gas exhibit area is shown above

Gas exhibit largest at metal show

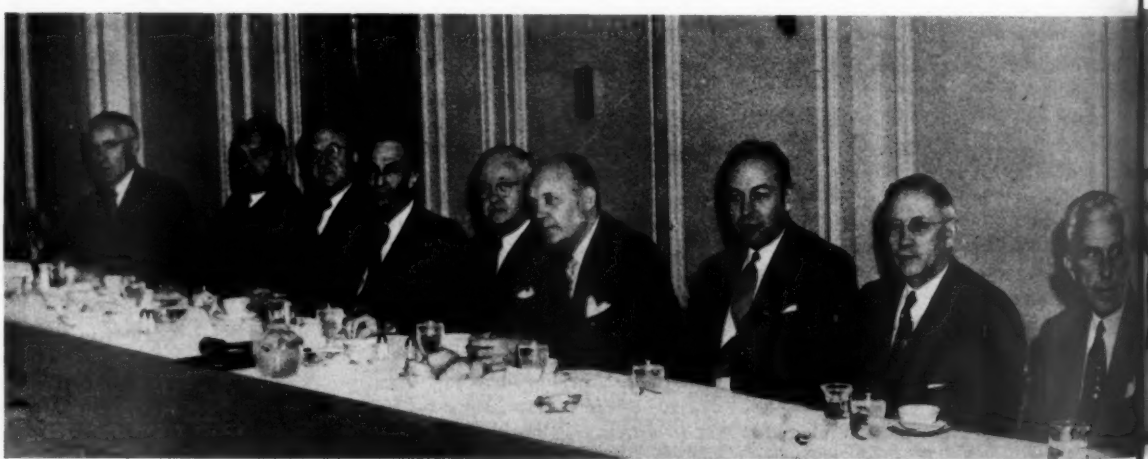
American Gas Association's mammoth Combined Industrial Gas Exhibit at the 1950 National Metal Congress and Exposition has extended still further one of the gas industry's most impressive records. Since the late 1920's A. G. A. has sponsored a combined gas exhibit each year the exposition was held. During all but a few of these years, the gas industry has sponsored the largest exhibit of the entire show.

Held in Chicago's International Amphitheatre the week of October 23, the exposition displayed the latest developments in an industry that is keeping one eye on the booming civilian production job and the other on probable military production demands. Nearly 50,000 members and guests of American Society for Metals visited the 4,000 square foot gas exhibit area where nine manufacturers of industrial gas equipment showed their wares.

Particularly eye-catching was a 175-foot long sign which proclaimed in three-foot letters: "Gas gives speed and economy in production line heating operations with gas-fired furnaces under precision control." Visible from all points in the arena, this statement tied in with the exposition theme. It pointed dramatically to the ever growing importance of gas fuel to the metal working industry.

Following is a summary of interesting uses of gas fuel shown by exhibitors cooperating with the Industrial and Commercial Gas Section.

Principal features shown in the booth of American Gas Furnace Company, Eliza-



Speakers' table at 1950 Industrial Gas Breakfast: (Left to right) Henry M. Heyn, Toledo; Fred O. Hess, GAMA; F. X. Mettenet, Chicago; O. P. Adams, Pittsburgh; C. H. Lekberg, Section chairman; Francis B. Foley, Bayonne, N. J.; C. C. Eeles, Toledo; D. A. Campbell, Cleveland; Stewart Parker, Chicago

Harold O. Andrew and Mrs. Hale A. Clark in the A. G. A. center at Metals Show

beth, N. J., were numerous special burners which developed flame patterns for precision application. These burners find wide application for glass forming and other uses where pin-point heat is required.

A new exhibitor this year was Combustion Control Corp., Cambridge, Mass., showing a new principle of complete flame failure protection device. The control system uses a new and revolutionary "Firetron" tube which "sees" only flames and will not operate on hot refractory or any other hot body. This exhibit drew many visitors who were deeply interested in its operation. A number of different types of gas burners were used to illustrate its wide application.

Continental Industrial Engineers, Inc., Chicago, limited their display to photographs and other means of showing installations of their equipment, plus a compact instrument for picking up and indicating radioactivity.

O. P. Adams (left), National Tube Co.; Carl H. Lekberg (center), Section chairman; Francis B. Foley, past-president, ASM

One of the interesting "live" exhibits was that of Gas Appliance Service, Inc., Chicago. This firm had several radiant burners in operation, as well as a small forge furnace to heat the ends of small stock quickly so as to minimize scale. Also shown was the Rotoflame forge furnace which heats stock by means of a swirling flame around the work.

Eclipse Fuel Engineering Co., Rockford, Ill., had a large space to show many types of burners, mixers and a new safety shut-off valve which operates on failures of power, gas or air pressure.

Charles A. Hones, Inc., Baldwin, N. Y., one of the oldest firms in the business, had two "Buzzer" furnaces in full operation, one at 2,000° F and another at 2,400° F, of muffle and semi-muffle types. These furnaces operate on atmospheric burners requiring no extra air supply or premixing equipment.

C. M. Kemp Manufacturing Co., Baltimore, Md., exhibited their mixing equipment, safety-control system and several special burners which visitors could operate by merely pushing a button on the display.

Largest exhibit in the gas area was that of Selas Corp. of America, Philadelphia —an attractive display of illuminated pictures of installations flanking a simulated setup for high speed heat treating of strip tin plate to produce a mirror finish. Their radiant cup burners for this purpose were cleverly made of plastic and produced *(Continued on page 30)*

Washington gas display helps dietitians

a PAR activity

SOME 3,500 registered dietitians from all sections of the country were shown the advantages of gas cooking and modern commercial gas equipment in Washington, D. C., during the third week of October. The event was a special exhibit sponsored jointly by the Association's Industrial & Commercial Gas Section and Washington Gas Light Company during exposition of The American Dietetic Association.

A center of interest in the show in the huge National Guard Armory was the gas lounge area where the Section's commercial cooking publications were displayed. Representatives of Washington Gas Light Company used the area to meet and discuss cooking and gas equipment with a continual stream of visitors. Many dietitians expressed interest in proper maintenance procedures needed to keep equipment in first-class operating condition.

A. G. A.'s contributions to the show continued a Section promotional activity aimed at helping the increasingly important group which directs volume feeding operations. Use of gas for institutional cooking has proved a desirable and profitable load for gas companies. Individual gas companies and the industry as a whole are becoming increasingly aware of the influence which dietitians have in the selection of commercial equipment.

Every effort was made in the cooperative gas exhibit to show dietitians the quality of gas service and its economy over other fuels.

Elizabeth Perry, president, American dietetic Association, chatting with Capt. John J. Bourke, formerly A. G. A. director of commercial cooking promotion

Commercial representatives of Washington Gas Light Company who answered questions of dietitians: (L. to r.) D. T. Watkins, J. M. Yowaiski and T. M. Offutt

Discussion of service department operations for companies planning changeovers

Conversion and the serviceman

By R. H. BUSSARD

Superintendent of Service
Washington Gas Light Co.
Washington, D. C.

This article is designed to discuss the interesting and unusual factors of service department operations as related to a system changeover to natural gas. It is hoped that such a discussion may in some small manner aid those contemplating such a change. Information presented has been gathered from answers to questionnaires by companies that have completed a changeover, from articles already on record, and personal experience of a conversion project in Washington, D. C.

Practically all companies when preparing for a changeover instituted a preconversion program for service department employees. This included studying the behavior of natural gas, emphasizing the characteristics of satisfactory natural gas flame; training in the technique of converting appliances, and studying appliances and installations which require special attention.

I would like to go beyond this type of training and stress the importance of selling the story of natural gas to your service department personnel. A very important person in your conversion picture is your customer-contact employee. If he is not given proper understanding of the problem before the changeover begins, in many cases he can very easily create customer reluctance to accept the "new" gas. He may cause unnecessary service requests and special investigations. Let me explain how this may occur.

The average person has the desire to show his "superior" knowledge. Even during normal operations, the matter of one employee criticizing the work of a fellow employee is an everlasting problem. When faced with a conversion performed by personnel other than company employees, the temptation to this inherent weakness is great. It is with grief and despair you hear the complaining customer say, "Your serviceman told me the men who converted my appliances didn't know what they were doing, and now my bill has increased, the water heater is leaking, the maid has headaches, etc."

When streaming of top burners was noticed in Washington the company personnel studying this problem unfortunately began referring to these ranges as "sub-standard" stoves. They used the expression of "insulating" to mean sealing and stripping to divert oven products

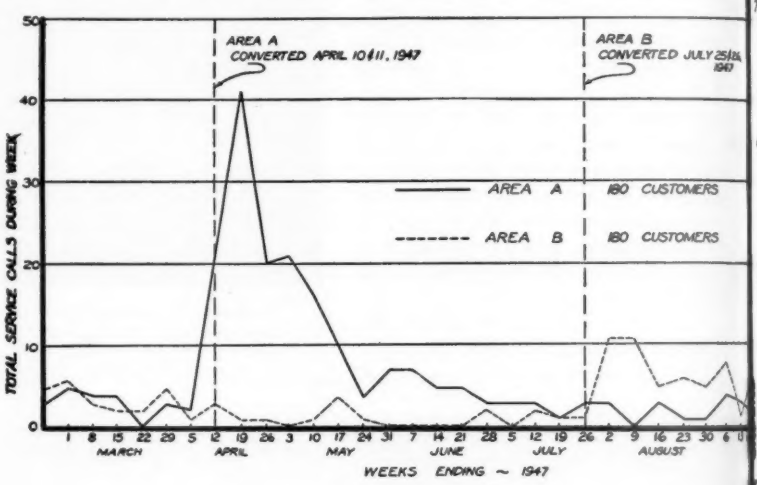


CHART I

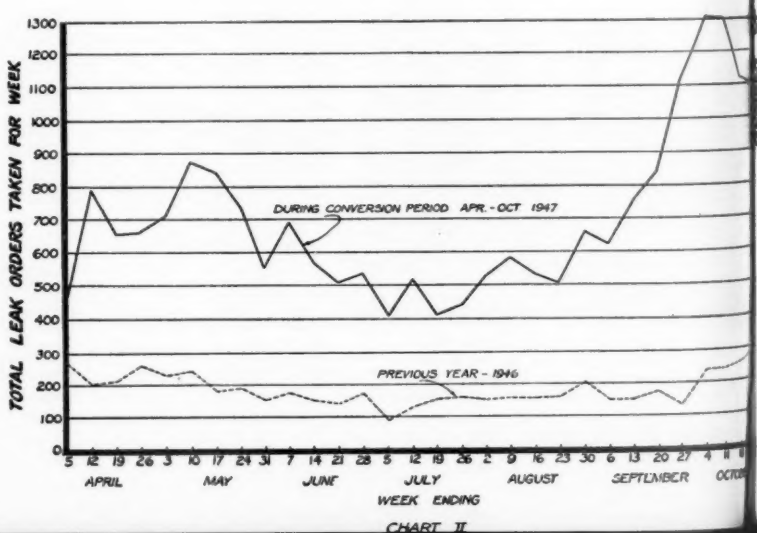


CHART II

An address presented before the Operating Section during 1950 A. G. A. Convention.

of combustion from the top burner compartment. In a short period of time these expressions spread to the customer-contact man. It wasn't long before customers were being told by some servicemen, when such a range was encountered, "I'm not equipped to correct this for you, madam, as this is a 'sub-standard' range and it will have to be 'insulated.' "

This could have been a customer who bought from the company a high-priced fully insulated range. Would you like to be on the company end of the telephone call resulting from this serviceman's statement? If she didn't buy the appliance from the company then she calls the builder, real estate agent, or apartment house manager and raises Holy Cain because she has an inferior product and she knows it is inferior because the gas man told her so.

What happens? The builder or agent calls the company, swears he will never use gas again, threatens suit because of libelous expressions, and demands the company replace the range with the type designed for natural gas.

There are those calls where the customer contacts the company, is dissatisfied with the appliance operation and knows her appliance will never operate to her satisfaction. The serviceman told her, "Natural gas will never work as well as the manufactured gas."

I have cited these instances to point out the value of selling your customer-contact employees on the benefits of the changeover. If they know it will result in a brighter future for them, then they will help to sell the dissatisfied customer rather than heap coal on the fire. Educate them on the problems relating to conversion. If you decide to utilize the services of a contractor to perform the conversion, point out the advantages of this method, the magnitude of the project, and the problems of the contractor. If this is done properly your men will be proud of the job being performed, less anxious to be critical, and tactful in their contacts. As part of its training program, one company used a two-act skit to emphasize proper customer approach, courtesy, and general conduct.

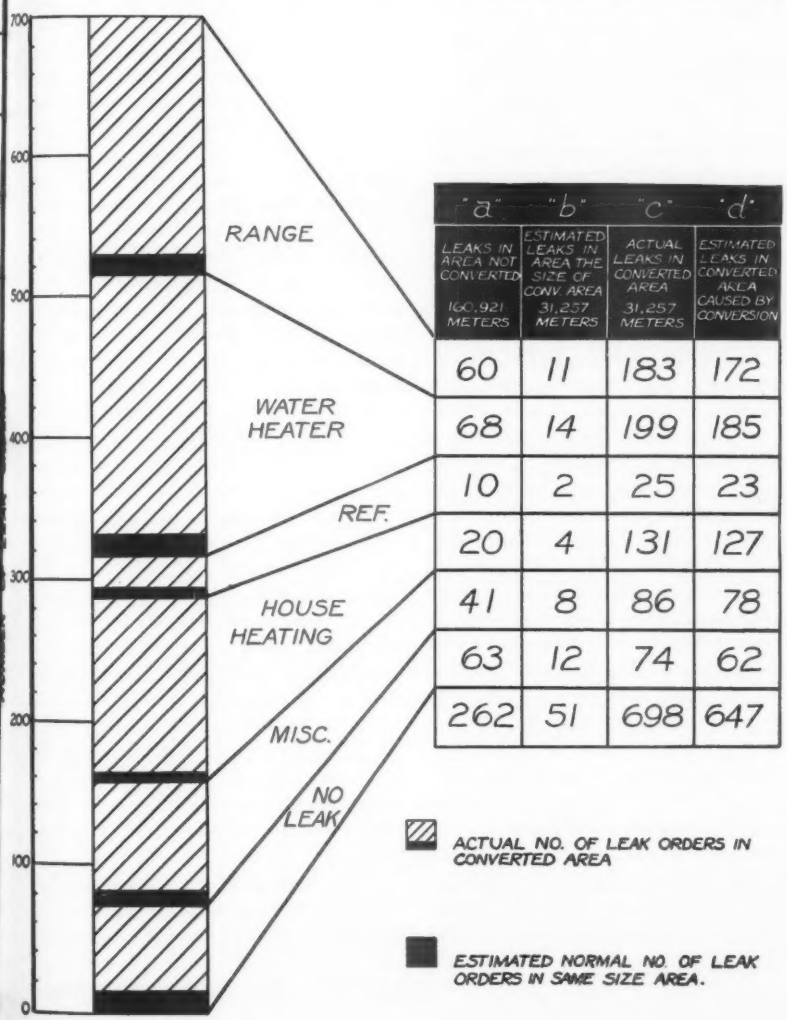
Selling the story of natural gas to your employees, prior to the changeover, is an extremely important item and should not be overlooked in maze of problems that arise when preparing for a conversion.

The largest single difficulty may be in converting the most common of all appliances—the range. As pointed out in the report of the 1930 A.G.A. Subcommittee on "The Study of Factors Involved in Changeover from Manufactured to Natural Gas" (American Gas Association PROCEEDINGS, 1931), in the early days of changeover it was found that the problem of oven flame floating was quite worrisome, especially when the combination coal and gas range was encountered. This required additional secondary air openings and did not permit over-gassing of the oven if desired.

More recently, in certain types of ranges when natural gas is used and the oven is in operation, it has been found that the products of combustion from the oven leak into the top burner compartments causing poor ignition and lifting of the flame from the top burner ports. This results in what is known as a "streamer." To correct this condition frequently involves caulking, use of special design flue outlet fittings and metal strips, or remodeling. Naturally you will be faced with customer resistance when you change the complexion of her favorite appliance.

It is highly recommended, if at all possible, that the performance of different makes of ranges be studied before the conversion starts. Design your correction methods, educate your men in recognizing "streamers." Train and equip a special group of men to handle the volume expected.

Because of the slower burning or less stable natural gas flame as compared to a gas containing an appreciable amount of hydrogen, you may expect to encounter difficulties in converting oil burner pilots and burner flames that are subject to disturbances in the air surrounding the flame. The sudden agitating of the atmosphere in the combustion chamber of an oil burner, the "swish" of railroad trains over the switch heater, or the speed of tin cans passing the burner, may create a disturbance sufficient to extinguish flame. The oil burner pilot can



"a"	"b"	"c"	"d"
LEAKS IN AREA NOT CONVERTED 160,921 METERS	ESTIMATED LEAKS IN AREA THE SIZE OF CONV. AREA 31,257 METERS	ACTUAL LEAKS IN CONVERTED AREA 31,257 METERS	ESTIMATED LEAKS IN CONVERTED AREA CAUSED BY CONVERSION
60	11	183	172
68	14	199	185
10	2	25	23
20	4	131	127
41	8	86	78
63	12	74	62
262	51	698	647

CHART III

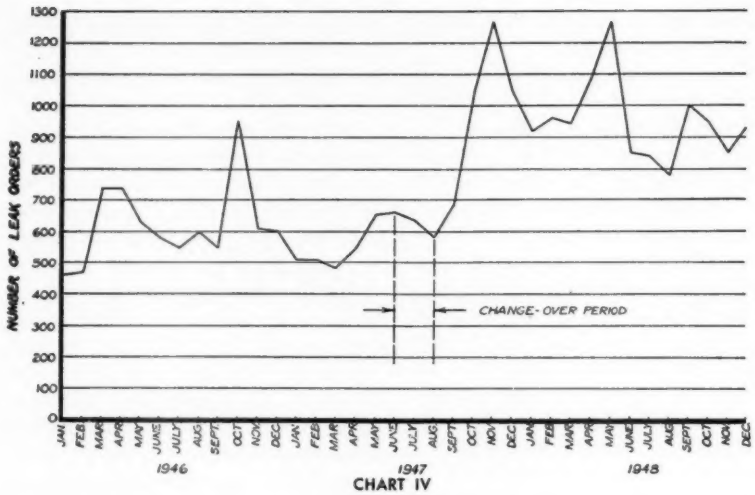


CHART IV

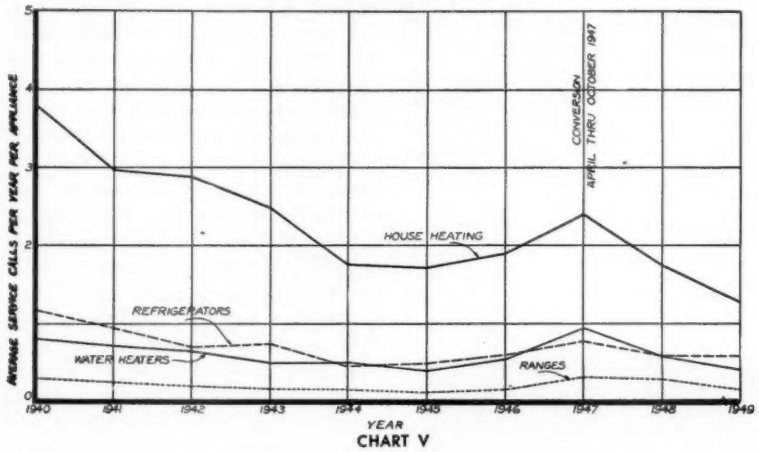


CHART V

be the source of many headaches, not only from a service angle but from high bill complaints, if the problem is not studied and sufficient men are not well skilled in its conversion.

It is recommended you investigate the conversion of dental torches, laboratory burners and other special burners. You may find it difficult to locate lab burners designed for natural gas operation that will give satisfactory service. This condition has been investigated by the National Bureau of Standards. For details I refer you to "A Study of Laboratory Bunsen Burners for Natural Gas" by John H. Eiseman NBS42, 541 (1949) RP 1991.

In many instances it is a problem to provide full rating or previous input on certain commercial appliances, more notably steam boilers, and broilers equipped with ceramics. There are two main reasons for this: (1) natural gas has a lower flame propagation rate and for its combustion, a relatively larger combustion space is needed; and (2) greater primary air inspiration is required, sometimes beyond the range of the shutter or venturi design. The almost universal practice of over-gassing of these appliances, which was possible when using manufactured gas, makes the problem more acute. Lowering burners and increasing orifice pressures are examples of how satisfactory conversions may be accomplished.

On radiant fire heaters and gas logs it is difficult to obtain good natural gas performance after conversion because of minor dirt or dust obstruction and the customer's desire to have these appliances over-gassed, as had been the case when using the manufactured or mixed gas.

Suppose you have mastered the techniques of how to convert, and the job starts. What problems follow?

You may expect to experience an immediate increase in service requests from customers in converted areas. As conversion progresses, the men performing the conversion become more skilled, procedures are improved and the efficiency of the conversion increases. Thus service requests per unit of customers reduce.

I know every service department supervisor when approaching a conversion job wants to know how much the work load will increase and how long it will last. I am sure there is no one who can give you the answer. Many factors are involved. Each conversion will most certainly have its own service load characteristics, depending on saturation of different makes and types of appliances, efficiency of the men performing the conversion, the season of the year when the conversion is performed, the condition of your distribution system, etc.

Guy Corfield in his article, "When a City Changes to Natural Gas," reports as a result of a survey: "Where considerable adjustment was necessary, complaints will be received from approximately 25 percent of the customers during the first two weeks following and will drop off rapidly."

For a more detailed study of the immediate effect a changeover has on service requests, I refer you to the experience of our company shown in Chart I. Two areas were studied. In each area 180 customers were selected for observation, representing a like number of appliances by types. Total service calls per week for these customers were plotted for seven weeks prior to the conversion of area A, which indicates they were comparable customers.

Area A was converted April 10 and 11, 1947. (The changeover project started April 1, 1947.) Area B was converted July 25 and 26, 1947. Note that the peak in area A is considerably higher than that of area B. This was probably due to two factors. First, the conversion efficiency at the time of area A conversion was relatively lower than when area B was converted because the conversion was only a few days old when area A was converted. Second, the effect of deficient conversions of house heating equipment in area A was immediately felt since house heating equipment was still in use, whereas in July, when area B was converted, this was not true.

The chart gives an indication, because of the many variables it is only an indication, of how long the immediate

impact of a conversion is felt in any particular area. You will note that I say immediate impact. You, who may have a conversion performed in the summer and also have an appreciable saturation of house heating, will not experience the full force of service requests of the conversion job itself until you advance into your heating season.

One of the most annoying types of service order, at any time, is the leak complaint. I mention this because you may find an increase in this type of order.

Chart II shows the number of leak complaints received by our company during its conversion period, compared to the same period the year before. We made a spot check of leak orders in May of the conversion year when 16 percent of the total meters had been converted. At that time leak complaints per thousand meters in the converted areas averaged 22.3, and 1.6 for those meters in the unconverted area.

A study of the leak orders for this spot check is shown on Chart III. At that time 698 leak orders were recorded for the 31,257 meters converted and 262 orders for the 160,921 meters not converted. An attempt was made to estimate the number of leaks which were the result of conversion, by first recording in column "a" the leaks received in the unconverted area (160,921 meters). Column "b" estimated the leaks that would have been received from an area the size of the converted area (31,257 meters) based on the experience in the unconverted area (leaks in "a" multiplied by 31,257 ÷ 160,921). This was subtracted from the actual number of leaks received from the converted area (column "c"). The result is shown in column "d". *(Continued on page 44)*

Industrial relations round-table

Prepared by
A. G. A. Personnel Committee

● **An agreement** between Pacific Gas and Electric Company and the International Brotherhood of Electrical Workers, AFL, effective September 1, 1950, includes the following significant preamble:

"Section 1. The parties recognize that the free private enterprise system in the United States has produced the highest standard of living anywhere in the world, and they hereby confirm their adherence to, and belief in, that system. In accordance with such belief the parties support the principle of private ownership of public utilities under enlightened regulation by public authority. Further, the parties support the principles of collective bargaining and self-organization."

● **Military leave policies**—The Bureau of National Affairs has recently completed a special survey of the military leave policies of 500 corporations. The survey covers such subjects as: (1) who is granted military leave rights; (2) benefits on departure for military service; (3) benefits while in service; (4) reinstatement of veterans, and (5) other military leave policies. In addition to summarizing the results of the survey on these subjects, the texts of military leave policies of certain well known companies are also reproduced in the booklet. Copies may be obtained from The Bureau of National Affairs, Inc., 1231 24 Street, N. W., Washington 7, D. C. for one dollar each.

● **Draft specter**—If your company has lingering doubts about the draft eligibility of key men, it might be a good idea to get from the local Selective Service Board the new form SS 170—"Civilian Users Force Analysis Sheet." It is designed to help determine the status of your entire staff by charting personnel according to age groups and the relative importance of their jobs—and chances of being drafted.

● **Veterans' reemployment rights**—Latest official information available regarding veterans' reemployment rights is made available in an 88-page "Question and Answer Handbook." It is published by Bureau of Veterans' Reemployment Rights, Department of Labor. The booklet contains 314 questions and answers on this subject.

● **Need workers**—Uncle Sam is today extending a polite invitation to employers: If you need workers, please contact the nearest government employment office. Tomorrow, though, that invitation may become an order. A scramble for workers is already under way, and Labor Department officials expect the pinch to spread as soon as new defense contracts are placed in large numbers. If the manpower problem gets critical, the Administration will seek manpower controls from Congress that will make it impossible for employers to recruit workers except through local employment service offices.

A recent Labor Department check on the manpower situation indicates a mounting demand for skilled workers in almost 50 occupations, ranging from civil engineers and welders to bricklayers and lumbermen. Demand is heaviest on the West Coast and in other scattered industrial centers. Labor Department officials expect much of this demand can be met through the U.S.E.S.

The Labor Department survey indicates that employers are already finding it necessary to relax their hiring standards somewhat and fill their needs by hiring older workers and those with physical handicaps.

This is the view expressed by Philip Geyelin in *The Wall Street Journal.*

● **Don't forget the stenographer**—They're more labor-short than any other white-collar category. Employment agencies report they get nine calls for every one girl available.

● **Employee communications in an era of mobilization**—Though the pains of international conflict are as yet relatively moderate, certain industrial therapists are looking over the medicine cabinet. In a matter of months or even weeks, they figure, they may be faced with the need for rearranging the employment pattern, for establishing a new type of relationship with employees.

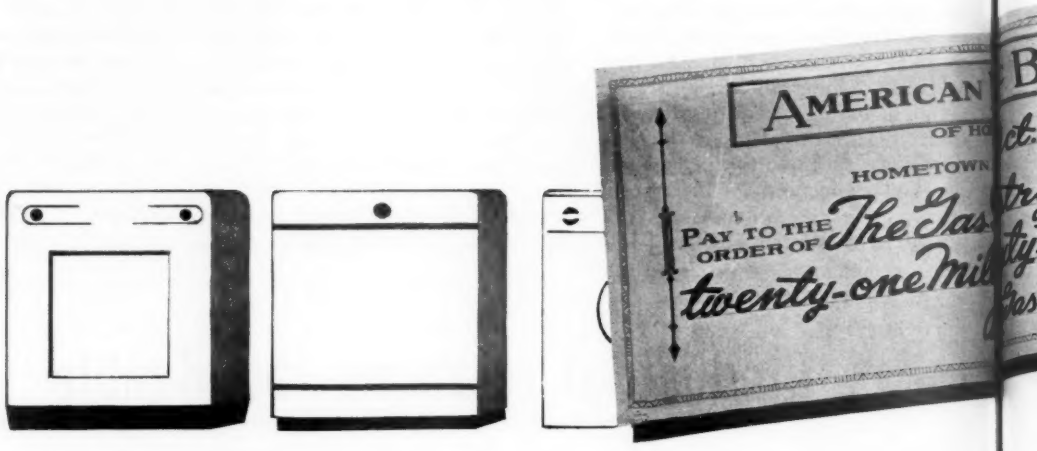
Here are a few symptoms, culled from the ledgers of companies already in the throes of change: (1) Many companies are today revamping and modernizing their indoctrination manuals, against the day when personnel and supervisors will be too busy to explain what the new employee ought to know. (2) The president's letter to employees is taking on a new tone. Employees right now want to know what the boss thinks. (3) Communications with supervisors are becoming more important than ever. (4) The employee publication promises to undergo the major change of all the devices of communication. If it's primarily a morale job on the home front, certain companies are beginning to reason that talk about competition, about customer importance, and such things must yield to sterner talk about saving, and about the consequences of hoarding. Some publications already have entered upon vigorous editorial campaigns against reckless spending. Others have revived their mailings to men in uniform, because part of the employee publication's job is to carry to these men the news of home.

These observations appeared in *Advertising Age* and were written by Robert Newcomb and Marg Sammons.

● **Tables of working life**—The Bureau of Labor Statistics has published a new report, "Tables of Working Life," in which the work life and life expectancy of men is compared, and in which data is given on the trend of old age dependency, the rate of growth of the labor force, and occupational separation rates. Of interest to those who are concerned with pensions and other problems of old age dependency is a table which

(Continued on page 48)

• *It's worth fighting for! A ten percent saturation of automatic gas clo*



Opportunity unlimited with the

By C. H. RIPPE

Sales Director, Home Appliance Division, Hamilton Manufacturing Co. Two Rivers, Wis.

There is one thing stronger than all the armies of the world, and that is *an idea whose time has come.*" These words, spoken over 100 years ago by the philosopher Voltaire, best describe without any exaggeration the idea that has evolved into a gigantic new market for the appliance industry.

The idea broke upon the mind of a little man who was doing the family washing and performing the arduous task of stretching the clothesline and hanging up the clothes. He was moving tons every year, and walking many miles, just as the housewife does. Finally, he said to himself, "Surely, this job of drying clothes can be done in simpler fashion than as a slave would do it."

Ross Moore began to think, and the idea was born. He struggled with his first model, and the depression came on. But he had full faith in the idea, and as he worked on through the years, the idea took shape. Patents were granted to Ross Moore on a gadget called an "automatic clothes dryer." This gadget consisted of a cabinet within which was a slowly revolving drum. Clothes placed in this drum would be dried by means of gentle tumbling through warm clean, moving air.

The firm making the first 50 dryers in Minneapolis was threatened with bankruptcy, and Ross began to look around for a new source. In Chicago, he ran into a representative of a little company in Two Rivers, Wis., and together they went up to the factory to talk it over. Contracts for the sales and manufacturing rights were finally signed just one week before Pearl Harbor. Before complete stoppage of the manufacture of appliances became effective, some 5,000 dryers were produced, and these became a testing ground and a research laboratory during the war years. By V-J Day, the dryer had passed the test of actual use.

Improvements and changes in design were necessary, of course, and there remained ahead a tremendous job of selling, promotion and education. But the field experience of those war years brought out one fact more important, more pertinent than all the others. Almost without exception, those housewives who had used the dryer endorsed it and praised it in a manner never before paralleled in the history of the appliance industry.

To use the words of Mrs. Mary Hall, Elizabethtown Consolidated Gas Co., "Women just loved it."

Statements like this were the rule, not the exception: "My dryer saves me more work, more time and more backaches than any appliance I've ever owned."

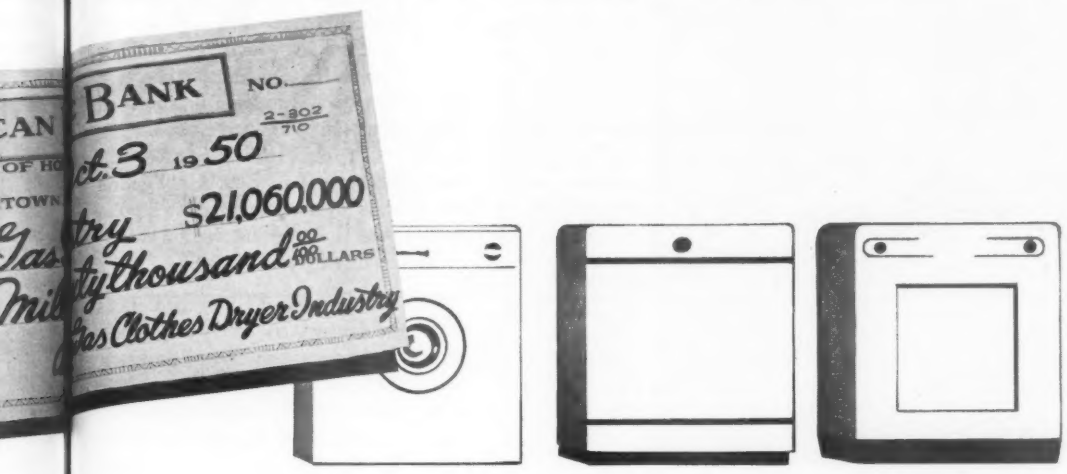
"I'd give up any other appliance in my home before I'd let you take my dryer."

Two wonderful groups of women pitched in to help us tell the dryer story to millions of American homemakers. One group was the equipment editors of women's magazines. They have played a tremendously important part in the dryer success story. The other group was composed of hard-hitting home service girls.

With women like that plugging for you, and with the housewives in love with you, how can you miss? You can't

Presented before Residential Gas Section at 1950 A. G. A. Convention.

as clothes would bring the gas industry this large check for new annual revenue



thew automatic gas clothes dryer

if you tell enough women the powerful, romantic story of the elimination of washday drudgery.

What is that story? What are some of the things women like about the dryer? I will only mention a few of them briefly. The automatic gas clothes dryer—

(1) Takes all the hard work out of washing. It *is* hard work, and it's dangerous to lug heavy baskets up and down cellar steps.

(2) It's the greatest time-saver in Mrs. America's home. Now she can wash, dry, and iron her clothes all in the same day, or in the same evening, as she wishes.

(3) It does away with weather worries. The happy housewife's theme song becomes "I don't care if the sun don't shine, I can do my washing anytime, 'cause I've got a dryer."

(4) The automatic gas dryer is sanitary and healthful. It's not only healthy for your clothes, but more important, for your wife and family.

(5) It saves clothes, and it saves money, because it permits reduced wardrobes of linens and towels and children's clothes.

(6) It does away with the need for those unsightly lines in the basement or the back yard. It takes the ropes off your living space.

Those are a few of the more important things that make women "just love" their dryers. But perhaps a word of caution is in order when it comes to talking about the labor-saving and time-saving appeals. The following article appeared in the *Milwaukee Journal* on Sunday, September 17:

Gives free time

"The advertisements say, 'Buy an automatic clothes dryer and have lots of free time!'

"A friend dropped in on Mrs. Ruth Adams of 4006 N. 41st Street, the new owner of an automatic clothes dryer, late one day last week and found Mrs. Adams limp and exhausted.

" 'That dryer will be the death of me yet,' she complained. 'I was so proud of it and the day was so nasty outside that I urged, practically pleaded with my neighbors to use it to dry their clothes.

" 'Well, I've spent the whole day loading and unloading it and folding clothes. That over there,' she said, pointing to a neatly stacked bundle of laundry, 'is the sixth washing I've dried today.' "

So far, I've discussed the reasons for owning a dryer. The logical questions to discuss next are: Who are your prospects? How can you turn those prospects into dryer sales?

The answer to the first question is easy. Your prospects are tens of millions of American women who still use old-fashioned drying methods. Your prospects are tens of millions of American women who say to themselves, or to their husbands, "Oh, why do I have to go through this terrible ordeal every washday?" Your prospects are 98 out of every 100 housewives, because only about two women in 100 own a clothes dryer today.

How to sell dryers? I know of no magic formula. You're going to sell dryers by doing pretty much the same things that have always sold merchandise for you before—by careful planning, mass advertising and publicity, and aggressive salesmanship.

Over and above that, if there are any "secrets" in this matter of selling dryers, I think they are principally these:

(1) Put the dryer in your show win-

Four New Freedom Gas kitchens unveiled

Lyon Kitchen—one of four New Freedom Gas Kitchens exhibited at the gas appliance exhibition in Atlantic City this fall. (Left to right) Norval D. Jennings, A. G. A.; Edith Ramsay, American Home Magazine; Leonard Rhodes, Lyon Metal Products Company

Mutschler Brothers Kitchen (above), with dinette and maple furniture. (Left) St. Charles Terra Cotta (apartment-size) and Blue Flame (large de luxe size) Kitchens. Each of the four New Freedom Gas Kitchens shown in Atlantic City featured ventilation over gas range and gas refrigerator

dow and run "live demonstrations." Dramatize the simplicity of the modern, automatic way.

(2) Use the user. A satisfied customer is your best salesman.

(3) It has been proved conclusively that the best merchandising method is to put dryers into the homes of prospects on a free home trial basis. Dryers "sell themselves." Get one into the prospect's home; let her use it without obligation for 30 days (when government regulations permit). Then just try to take it out! She won't let you.

Let's take a look at the record. Let's see if the business is there, and who's giving the business to whom.

In 1947, the first year of full-scale dryer production, 58,000 dryers were sold. In 1948 sales jumped to 88,000 units. During 1949, a year in which sales of many other appliances declined sharply, dryer sales increased to 106,000.

For the first eight months of 1950, 181,000 dryers were sold as compared to 45,000 units for the first eight months of 1949—an increase of more than 300 percent! In spite of the severe material shortages now prevailing, the industry seems certain to pass the 300,000 mark this year.

It looks like the business is there. Now let's see who's getting the business. From 1947 through 1949, a total of 252,000 dryers were sold, of which 60,000 or 24 percent, were gas-fired. For the first eight months of 1950, some 36,000 gas dryers have been sold—20 percent of the total.

It is quite obvious who's getting the business. Will you be satisfied to ride along with a 20 percent share? I cannot believe that you will.

Many gas men still ask, "Is it worth our while to do the things that are necessary to promote and sell the gas dryer?"

The answer to that is a loud, resounding *yes sir, it is!* I could give many reasons why, but let's just consider the one aspect that is uppermost in your minds—gas load.

Keep in mind that there is a very important auxiliary benefit to the gas company that does not necessarily appear in the annual consumption figures. At present, electric dryers are outselling gas-fired dryers by a wide margin. The installation of an electric dryer involves running a 220-volt line into the house. This additional electrical capacity in the house poses a very real threat to both the gas cooking and *(Continued on page 46)*

A. G. A. adds new research bulletins

a PAR activity

Three new research bulletins devoted to industrial and commercial research, general utilization research and water heating research have been released by American Gas Association Laboratories. All were produced and published under the PAR program.

Research Bulletin 56, A Study of Small Diameter Gas Glow Tubes, was sponsored by A. G. A. Committee on Industrial and Commercial Gas Research. The work explores for the first time the many technical aspects of the use of small size refractory tubes made of silicon carbide for use at temperatures above 2,000 degrees. Tubes of four-inch inside diameter and larger are successfully used for various heat treating and annealing processes. The Laboratories study was centered around design relationships and the performance of tubes of three-inch diameter and less. Heat transfer equations were developed for tubes of one and three inches in diameter.

Research Bulletin 57, a general utilization research publication sponsored by the Committee on Domestic Gas Research, presents technical data on the design, construction and performance of pilot burners. It is based on a study of those design factors related to air injection and flame characteristics. The study is an extension of basic information developed on the design of gas ignition systems compiled and presented in three other publications. These are Research Bulletin 42, A Study of Bimetallic Thermal Elements; Research Bulletin 46, Research in Design Methods of Preventing Closure of Gas Pilot Burner Air Openings by Dust and Lint; and Report 1123-A, Research in Pilot Design, Construction and Performance.

Research Bulletin 58, also sponsored by the Committee on Domestic Gas Research, presents the results of a fundamental study of condensation in water heaters. The work analyzes the individual factors contributing to the formation of condensation and reviews known methods in use for minimizing and reducing the undesirable effects of this phenomena. New suggestions, based on experimental results as well as the factors studied, are also presented.

Requests for copies of these bulletins should be addressed to American Gas Association Laboratories, 1032 East 62 St., Cleveland 3, Ohio. Prices are as follows: Bulletin 56—$1.25 a copy; Bulletin 57—$1.00, and Bulletin 58—$1.25.

A. G. A. appliance inspectors on the job

For the first ten months of the year, inspectors of American Gas Association Laboratories completed 900 calls on manufacturers to examine the construction of approved gas appliances and listed accessories. A total of 3,661 basic models were inspected and checked for compliance with American Standard Requirements. In addition nearly 500 calls were made to inspect equipment on user's premises.

More than half of the calls made on manufacturers were for annual renewal of approval. The balance were of an unannounced nature together with a few for special purposes. Unannounced inspections for the year have been practically completed. Those inspections designed for renewal of approval for 1951 are well advanced and are expected to be completed early in the new year.

Appliances and accessories were found generally satisfactory with construction complying with that approved. In the few cases where appliances were unacceptable as examined, prompt steps were taken for their correction. Inspections were conducted from both the Cleveland Laboratories and the Pacific Coast Branch in Los Angeles.

Final action due on requirements revisions

Revisions to gas appliance requirements affecting central heating equipment, water heaters, automatic pilots and unit heaters will be presented to the Association's Approval Requirements Committee for final action at its March 1951 meeting.

The subcommittee for central heating appliances will meet during January to review revisions now before the industry for criticism and to consider the comments received. One of the significant changes proposed is the splitting of the text for central heating appliance requirements into two volumes. Volume I would contain the standards for boilers and central heating furnaces and Volume II those for floor furnaces and recessed heaters.

During October the subcommittees for water heaters, automatic pilots and unit heaters met at A. G. A. Laboratories to consider revisions in their respective requirements.

The water heater group adopted revisions which would permit the certification by the Laboratories of water heaters delivering water at 180 degrees F. Such equipment would be required to bear special marking. The committee also decided to issue for criticism a more stringent draw-off test and requested manufacturers to investigate its feasibility.

Subcommittee for automatic pilots reviewed proposed changes which had been distributed for criticism. These strengthen and upgrade current standards to increase the safety of contemporary equipment using automatic pilots.

Unit heater subcommittee adopted new tests for efficiency, fire hazard and draft hood spillage. Several proposed revisions are to be resubmitted to the industry for criticism since extensive changes in the proposed text were made. After comments have been received, the committee will act on these by letter ballot.

Adoption of these new revisions by the Approval Requirements Committee in March will enable them to become effective on January 1, 1952.

Industry news

Conservation theme of Ebasco safety meeting

ACCIDENT PREVENTION—an important factor in the conservation of manpower and money, was the keynote of the twelfth annual Ebasco safety meeting. Gathered in Chicago's Blackstone Hotel, October 16-20, over 100 operating and personnel executives of client utility companies heard H. H. Scaff, Ebasco vice-president, open the first session by stressing the importance of accident prevention in the nation's present emergency.

Physical and psychological weapons of enemy agents and saboteurs were described by Colonel W. L. Furbershaw, vice-president, Chicago Civil Defense Plant Protection Committee. Colonel Furbershaw declared that the country's industrial strength would be its major weapon and the enemy's prime objective in any international conflict. First step in a productive security program, he said, is to organize plant protection teams at the "shop" level under the leadership of a top executive of the company. Practical defense plans of major utility companies were discussed in detail.

T. C. Westcott, president of Ebasco, addressed the luncheon meeting. All available tools from comic books to first aid training programs, must be employed, he declared, to get the safety lesson across.

Speaking in the same vein, C. T. Evans, vice-president, Arkansas Power & Light Co., outlined the necessity for creating a keen awareness of the need for safety practices and precautions. Safety lessons should be so well learned and taught that they become a part of the worker's heart and mind.

Six companies or divisions which attained accident records of 25 percent or below the national average in Ebasco's 1949-50 safety award program, were announced by Mr. Westcott.

The transportation department of New Orleans Public Service Inc. was awarded the Ebasco gold plaque for a record 78.63 percent below the national average for transit operations. Mississippi Power & Light Company won the silver plaque for bettering the national average for electric utilities by 63.18 percent. Companies receiving achievement certificates for excellent performance in accident prevention were United Gas Corp., West Tennessee Gas Co., Columbus Transit Co., and the electric and gas departments of New Orleans Public Service Inc.

The three-day session also included a panel discussion of safety problems, conducted by C. A. Clift, Arkansas Power & Light Company. A talk on safety organization by E. S. Beaumont, The People's Gas Light & Coke Co., Chicago, was followed by a discussion of employee relations and morale factors that affect safety, by C. L. Hightower, United Gas Corporation. Dr. Walter A. Cutter, New York University, led a discussion on motor vehicle safety and the problems of driver-training programs. A round-table session directed particularly to electric, gas and construction operations and a symposium on safety training completed the agenda.

Rheem planning to produce gas refrigerator

RHEEM MANUFACTURING COMPANY is preparing to produce and market a new gas-absorption type of household refrigerator, President R. S. Rheem announced on November 13.

The refrigerator, developed by Clayton and Lambert Manufacturing Co., Louisville, Ky., will be made by Rheem under an exclusive agreement just concluded between the two companies.

In the process of development and testing for more than five years, the new refrigerator will be available in popular capacities. It will be sold under the Rheem name. Intensive field and laboratory tests have shown high operating performance and efficiency. Further testing and design study will be carried out prior to manufacture of the unit in commercial volume.

Already a leader in the gas appliance field with its complete line of water heaters and heating equipment, the company considers the refrigerator a natural addition to its household appliance division.

"The decision to produce this completely new gas refrigerator is another major indication of our unbounded faith in the future of gas as the popular household fuel," Mr. Rheem said.

Gas range shipments heading for new peak

THE MONTH of October 1950, from the standpoint of unit shipments, was the second highest month in the history of the domestic gas range industry.

Preliminary figures released by Gas Appliance Manufacturers Association show that industry shipments of domestic gas gas ranges totaled 303,800 units during October 1950, compared with 257,500 units shipped in October 1949. The previous peak month was August of this year when 331,500 units were shipped.

During the ten-month period ending October 31, 1950, industry shipments totaled 2,508,400 units, an increase of 51.4 percent over the 1,656,500 units shipped during the same period of 1949. During the first ten months of 1948, the industry's peak year, some 2,416,600 domestic gas ranges were shipped.

A.G.A. offers gas industry a television "scoop"

a PAR activity

A NEW FILM SERIES, "Food Is Fun," has been completed under the sponsorship of American Gas Association as a PAR activity to help the gas industry take full advantage of market potentialities offered by television. The "Food Is Fun" series is designed to give each local sponsor a top-flight economy program at costs well below those of similar live shows of equal quality.

"Food Is Fun" is a series of half-hour home economics films which bring an outstanding television show within the reach of practically every gas utility. Louise Winslow, well known television personality, illustrates correct cooking procedures and tells the general story of the benefits of modern gas equipment. In addition, each 30-minute show includes 2½ minutes for messages by local gas companies.

A novel feature of the series is use of the new three-camera technique. Three movie cameras, cued by a director from Cinecraft Productions, Inc., photograph the action in long, continuous sequences. This produces at reduced cost a photographic effect identical with the most expensive kind of *live* television.

Gas industry premiere of "Food Is Fun" took place in Atlantic City last month during the 1950 American Gas Association Convention. Attended by an overflow audience, the meeting was directed by H. E. Eckes, The East Ohio Gas Co., Cleveland, chairman of the A. G. A. Television Committee which sponsored the film series. Assisting Mr. Eckes were D. W. Reeves, Oklahoma Natural Gas Co., and C. Fred Westin, Public Service Electric and Gas Co., Newark, New Jersey. Both men are members of the committee.

Also assisting in the preparation of the film series were members of the A. G. A. Television Advisory Committee of home service directors. Members of this group include: Mildred Clark, Oklahoma Natural Gas Co.; Mary Huck, The Ohio Fuel Gas Co.; Isabel McGovern, Minneapolis Gas Co.; Gladys Price, Southern California Gas Co.; Routh Soule, The Brooklyn Union Gas Co., and Jessie McQueen, A. G. A. home service counsellor.

Full information on rental prices for the series and purchase prices for full-color Kodachrome prints can be obtained from Promotion Bureau, American Gas Association, 420 Lexington Ave., New York 17, N. Y.

PCGA commends A.G.A. water heating promotions

INDUSTRYWIDE progress in the promotion of modern gas water heating is dramatized by a special resolution unanimously adopted on October 17, 1950 by the Water Heater Division of the Manufacturers Section, Pacific Coast Gas Association.

Signed by Arthur Dolan, chairman, PCGA Water Heater Division, the resolution expresses sincere appreciation to American Gas Association for its "effective and substantial contribution to the betterment of this section of the gas industry." Major elements of the recent A. G. A. promotions, sponsored under the PAR Plan, have been the Size 'Em Up Campaign and A. G. A. national advertising on gas water heating. This combined promotion was run in conjunction with the nationwide Court of Flame campaign sponsored by Gas Appliance Manufacturers Association.

The Pacific Coast resolution noted that A. G. A.'s advertising, sales promotion effort and publicity have "attracted favorable national attention, and effectively stressed the importance of installation of adequately-sized, top-quality, gas water heaters.

"This A. G. A. program costing thousands of dollars has had a marked and beneficial effect upon the sale of larger and better quality domestic gas water heaters," the resolution concludes.

The domestic gas water heater sizing program was originally developed by Pacific Coast Gas Association. It has been featured recently in the A. G. A. promotions designed show the necessity for an adequate supply of hot water at all times for the satisfactory operation of new automatic household appliances such as dishwashers and laundry equipment.

Virginia purchase

COMMONWEALTH Natural Gas Corp., Richmond, Va., has acquired approximately 99½ percent of the common stock of Portsmouth Gas Company. The latter company presently serves manufactured gas in the City of Portsmouth, Va. and in the counties immediately surrounding. Commonwealth will change over appliances to utilization of straight natural gas when that fuel becomes available in December.

Erick Larson is president of the new company. Other officers are: B. B. Ferguson, Jr., vice-president; John B. Thorn, secretary; Charles C. Drummond, treasurer; Chester E. Starkey and Robert W. Johnson, both assistant secretary and treasurer.

West Penn gas transfer

HOPE NATURAL GAS CO., Clarksburg, W. Va., is expected to take over the gas properties of Monongahela Power Co., Fairmont, W. Va., about December 1 subject to approval of state and federal regulatory commissions. The Peoples Natural Gas Co., Pittsburgh, has proposed to purchase the natural gas properties of State Line Gas Co., a Pennsylvania subsidiary of Monongehela Power.

The two transactions would mean the transfer of all the natural gas property and business of West Penn Electric System in which Monongahela is one of three principal subsidiaries. L. L. Tonkin is president of Hope Natural Gas Company and Edward M. Borger, president, The Peoples Natural Gas Company.

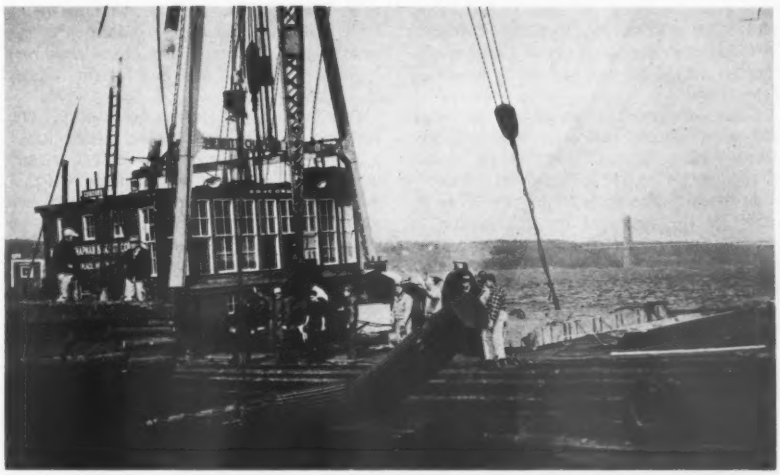
Mineral industries

PROBABLY the first book ever published on mineral industries education has been completed by Edward Steidle, dean, The Pennsylvania State College, School of Mineral Industries.

"Mineral Industries Education" drives home the fundamental economic truth that irreplaceable minerals furnish a great portion of the necessary primary wealth to insure national solvency and security. It also deals with the importance of education in the field of mineral arts and sciences.

The 252-page book contains 23 illustrations and may be obtained from Mineral Industries Extension, State College, Pa., for $3.00.

New York to have natural gas in December



Completing crossing of the Hudson River, one of the most difficult engineering feats in construction of Transcontinental Gas Pipe Line Corporation's 1,840-mile artery from Texas to New York—longest natural gas line in the country. Picture shows final 60-foot section being connected with pipe pulled under the river from Edgewater, N. J. to the metering station on the New York side. Beginning in December, the new line will deliver the first natural gas to reach New York City and the metropolitan area in large volume (Staten Island has been served from another line since August 1949). Transcontinental will supply natural gas to five local utilities in New York, Brooklyn, Long Island and Westchester

Purging handbook nearing completion

Purging Committee of A. G. A. Operating Section meeting in Cleveland November 8 and 9 to complete purging handbook project (l. to r.): H. E. Ferguson, The Peoples Gas Light & Coke Co.; Jesse S. Yeaw, Rochester Gas & Electric Corp., vice-chairman; J. Stanford Setchell, A. G. A.; P. W. Geldard, The Consumers' Gas Co. of Toronto; G. R. King, Philadelphia Electric Co., chairman; F. E. Vandaveer, The East Ohio Gas Co.; J. W. Penney, Boston Consolidated Gas Co.; H. S. Carpenter, Public Service Electric & Gas Co.; C. J. Smith, Consolidated Edison Co. of New York, Inc. Handbook is expected to be ready for industry use by the time of the next American Gas Association Convention

Residential gas "saturation" soars in last decade

NEARLY 60 percent of all dwelling units in the United States were served with gas for one or more purposes during 1950. Some 47.6 percent of these dwelling units received utility gas service and 10.8 percent were served with LP-gas, according to figures just released by the Bureau of Statistics, American Gas Association.

The A. G. A. Bureau's figures show that during the past ten years the gas utility industry has scored large gains in residential customers in all census divisions of the U. S.

For example, residential gas customers (including LP-gas customers) soared 56.4 percent during the past ten years to a 1950 record of 26,962,000. The number of residential gas customers served by city gas alone rose 33.6 percent during the past decade, from 16,435,000 in 1940 to 21,962,000 customers in 1950. At present there are at least five million residential LP-gas customers, mostly in rural areas.

During the same ten-year period, residential and rural electric customers increased 52.7 percent, rising from 24,599,000 on January 1, 1940 to 37,563,000 on March 31, 1950.

Particularly significant in the new A. G. A. report is the fact that the relationship of residential gas and electric customers is compared with the rise in number of occupied dwelling units.[1] This relationship is of prime importance since each dwelling unit[2] is a potential gas and/or electric customer. These data, presented in the large accompanying table, therefore give a clear indication of the saturation of residential gas utility customers by state, census division, and for the country as a whole.

COMPARISON OF RESIDENTIAL GAS CUSTOMERS, ELECTRIC CUSTOMERS AND OCCUPIED DWELLING UNITS, 1940-1950

	1950	1940	INCREASE Actual	INCREASE Percent
Occupied dwelling units[a]	46,151,000	37,326,000	8,825,000	+ 23.6
Residential gas customers[b]				
City	21,962,000	16,435,000	5,527,000	+ 33.6
LP	5,000,000	800,000	4,200,000	+525.0
Total	26,962,000	17,235,000	9,727,000	+ 56.4
Residental & Rural Electric Customers[b]	37,563,000	24,599,000	12,964,000	+ 52.7

[a] data as of April 1, [b] data as of March 31, 1950 & January 1, 1940

On April 1, 1950, there were 46,151,000 occupied dwelling units in the United States, a rise of 23.6 percent from the 37,326,000 units occupied on the same date in 1940. A comparison of gains in residential gas customers and occupied dwelling units shows that the number of residential (city and LP) gas customers has increased more than the number of new dwelling units. Thus, residential gas usage has been extended during the past decade to areas not previously supplied with gas service and to areas where gas has been replacing some other type of fuel.

It is a well known fact that the past decade has witnessed a record construction of large natural gas pipelines and expansion and extension of existing systems. A substantial part of the amazing growth in residential gas customers can be attributed to the fact that the booming natural gas industry has made increasing supplies of this inexpensive, efficient fuel available to ever larger areas of country.

[1] See article on relationship between growth of residential gas and electric customers and growth of population, A. G. A. MONTHLY, October 1950, pp. 30 and 31.

[2] Dwelling units are preliminary figures from the Bureau of the Census.

Home service panel, discussions head Workshop agenda

THE HOME CALL, traditionally a basic operation of home service work, is today more difficult and more complex than ever before. Latest information and advice on developing successful home call programs will be featured next month at 1951 Home Service Workshop, Washington, D. C., January 3-5.

Sponsored by the Association's Home Service Committee, the Workshop will be held at the Hotel Statler and will cover all phases of home service operation, including demonstrations, gas service and gas equipment explanation and promotion. D. A. Hulcy, president of A. G. A., will address one of the luncheon meetings on the industry's accomplishments. Guest speaker, A. W. Conover, president, Equitable Gas Co., will explain utility's financial responsibilities in a talk entitled "Your Stake in Your Gas Company."

Questions that the industry wants to know about home calls will be answered by a special panel of nine home service directors representing different parts of the country and different size departments. Particular attention will be devoted to new problems that have arisen in home calls because of increased demands upon time and interests of the homemaker.

Panel members will be expected to offer detailed suggestions on the following subjects: value of the survey call; types of materials to be left on home calls; how to make appointments; how to build and maintain interest in the home call; how to report the home call to the company and how management hears of it. Other questions selected for consideration include: What training is needed for this work? How are reports made? In a larger system, how do people making home calls keep up-to-date on equipment?

Vivian Marshall, New Orleans Public Service Inc., and chairman, A. G. A. Home Service Committee, will preside at the Workshop. Ruth Sheldon, Washington Gas Light Co., will be in charge of local arrangements.

Featured speakers will include Ida Jean Kain, King Features newspaper writer, and Helen Kendall, Good Housekeeping Magazine. Miss Kain will tell her audience how to help make homemakers enjoy home service contacts. Title of her talk is "Do It With a Light Touch." Miss Kendall will show why the laundry is the most important new room in the modern home.

"Nutrition Up-to-Date" will be presented by Dr. Esther Phipard, Bureau of Human Nutrition and Home Economics in Washington. The impact of frozen foods on home service presentations will be discussed by Irene L. Muntz, Rochester Gas & Electric Corporation.

In addition, three demonstrations, "Swing Your Partner," "Platformalities," and "Showmanship" will give new ideas for school programs, women's clubs and theater cooking schools.

Also planned for the benefit of visiting home service representatives, sales managers and others interested in home service work, is a series of group discussions. Completing the Workshop will be a symposium of home service activities in eight or ten companies and showing of new gas industry films.

Metal show

(Continued from page 19)

such a realistic effect that the supposed temperature was indicated on an optical pyrometer.

For premixed gas blower equipment, The Spencer Turbine Co., Hartford, Conn., showed a larger blower. Other smaller Spencer Turbines were in operation at other booths for air supply of the live exhibits.

A. G. A. also maintained an information center for the convenience of visiting industrial gas men and visitors to the Metal Show. Several other manufacturers of industrial gas equipment had space outside the Combined Gas Exhibit. Surface Combustion Corporation and Lindberg Engineering Company had gas equipment on display on the main floor.

According to reports from several of the cooperating exhibitors the 1950 show was the most successful of any held so far. It was also announced that next year's Metal Show will be held in Detroit, October 15-19, 1951.

GROWTH IN RESIDENTIAL GAS UTILITY CUSTOMERS AND RESIDENTIAL AND RURAL ELECTRIC CUSTOMERS, BY STATE, COMPARED WITH INCREASE IN DWELLING UNITS, 1940-1950

(THOUSANDS)

DIVISION & STATE	DWELLING UNITS[a]			RESIDENTIAL GAS UTILITY CUSTOMERS[c]			RESIDENTIAL AND RURAL ELECTRIC CUSTOMERS[c]			SATURATION OF RESIDENTIAL GAS UTILITY CUSTOMERS		
	1950[b]	1940	% Change	1950	1940	% Change	1950	1940	% Change	1950	1940	% Change
Total United States	46,151	37,326	+ 23.6	21,962	16,435	+ 33.6	37,563	24,599	+ 52.7	47.6%	44.0%	+ 8.2
New England	2,894	2,438	+ 18.7	1,559	1,279	+ 21.9	2,622	2,118	+ 23.8	53.9	52.4	+ 2.9
Connecticut	614	488	+ 25.7	350	284	+ 23.1	560	436	+ 28.6	57.0	58.2	— 2.1
Maine	311	261	+ 19.6	41	35	+ 18.8	258	181	+ 42.3	13.2	13.2	0.0
Massachusetts	1,409	1,221	+ 15.4	950	792	+ 19.9	1,307	1,115	+ 17.2	67.4	64.8	+ 4.0
New Hampshire	192	158	+ 21.5	37	31	+ 19.6	169	123	+ 37.6	19.4	19.7	— 1.5
Rhode Island	245	204	+ 20.3	160	120	+ 33.6	222	188	+ 18.2	65.4	58.9	+ 11.0
Vermont	123	106	+ 15.3	21	17	+ 20.6	106	75	+ 41.2	16.7	16.0	+ 4.4
Middle Atlantic	9,206	7,875	+ 16.9	6,174	5,275	+ 17.0	7,938	6,493	+ 22.3	67.1	67.0	+ 0.1
New Jersey	1,509	1,224	+ 23.3	1,102	900	+ 22.3	1,325	1,051	+ 26.0	73.0	73.6	— 0.8
New York	4,652	4,033	+ 15.4	3,321	2,868	+ 15.8	3,983	3,365	+ 18.4	71.4	71.1	+ 0.4
Pennsylvania	3,045	2,618	+ 16.3	1,751	1,507	+ 16.2	2,630	2,077	+ 26.7	57.5	57.6	— 0.2
East North Central	9,372	7,682	+ 22.0	5,070	4,020	+ 26.1	8,097	5,987	+ 35.2	54.1	52.3	+ 3.4
Illinois	2,679	2,281	+ 17.5	1,595	1,315	+ 21.3	2,246	1,784	+ 25.9	59.5	57.7	+ 3.1
Indiana	1,233	1,006	+ 22.6	534	373	+ 43.2	1,077	737	+ 46.0	43.3	37.1	+ 16.7
Michigan	1,980	1,519	+ 30.3	1,005	734	+ 36.9	1,706	1,208	+ 41.3	50.8	48.3	+ 5.2
Ohio	2,417	1,978	+ 22.2	1,520	1,243	+ 22.3	2,115	1,603	+ 31.9	62.9	62.8	+ 0.2
Wisconsin	1,063	898	+ 18.4	416	355	+ 17.1	953	655	+ 45.6	39.1	39.5	— 1.0
West North Central	4,421	3,916	+ 12.9	1,671	1,226	+ 36.3	3,608	2,298	+ 57.0	37.8	31.3	+ 20.8
Iowa	815	727	+ 12.1	270	186	+ 45.1	708	467	+ 51.5	33.1	25.6	+ 29.3
Kansas	626	546	+ 14.7	331	220	+ 50.2	497	324	+ 53.3	52.8	40.4	+ 30.7
Minnesota	921	773	+ 19.2	322	256	+ 25.5	816	479	+ 70.4	34.9	33.2	+ 5.1
Missouri	1,270	1,140	+ 11.3	536	401	+ 33.7	992	652	+ 52.1	42.2	35.2	+ 19.9
Nebraska	417	387	+ 7.7	156	120	+ 30.0	329	235	+ 39.8	37.4	31.0	+ 20.6
North Dakota	177	163	+ 8.4	24	18	+ 35.6	127	65	+ 97.4	13.8	11.0	+ 25.5
South Dakota	195	180	+ 8.6	32	25	+ 31.3	139	76	+ 84.0	16.6	13.7	+ 21.2
South Atlantic	6,020	4,547	+ 32.4	1,499	1,037	+ 44.6	4,562	2,153	+118.8	24.9	22.8	+ 9.2
Delaware	97	75	+ 28.3	48	30	+ 59.5	84	48	+ 75.1	49.5	39.8	+ 24.4
Dist. of Columbia	235	185	+ 26.8	165	152	+ 9.0	160	135	+ 18.4	70.3	81.8	— 14.1
Florida	961	590	+ 62.8	162	100	+ 61.7	697	288	+142.4	16.9	17.0	— 0.6
Georgia	967	797	+ 21.4	191	107	+ 78.9	692	274	+152.6	19.8	13.4	+ 47.8
Maryland	691	500	+ 38.2	357	257	+ 38.9	538	355	+ 51.3	51.7	51.4	+ 0.6
North Carolina	1,059	821	+ 29.0	64	46	+ 39.3	874	340	+156.7	6.1	5.6	+ 8.9
South Carolina	559	459	+ 21.9	39	26	+ 47.5	406	140	+188.8	6.9	5.7	+ 21.1
Virginia	906	660	+ 37.2	213	130	+ 63.9	675	336	+101.1	23.5	19.7	+ 19.3
West Virginia	545	460	+ 18.4	260	189	+ 37.6	436	237	+ 83.9	47.8	41.1	+ 16.3
East South Central	3,203	2,736	+ 17.1	678	381	+ 77.8	2,295	931	+146.6	21.2	13.9	+ 52.5
Alabama	847	708	+ 19.6	167	77	+116.4	624	234	+166.6	19.8	10.9	+ 81.7
Kentucky	821	729	+ 12.6	246	177	+ 38.8	598	287	+108.5	30.0	24.3	+ 23.5
Mississippi	610	557	+ 9.5	123	51	+141.1	377	115	+228.0	20.1	9.1	+120.9
Tennessee	925	742	+ 24.7	142	76	+ 87.2	696	295	+135.8	15.3	10.2	+ 50.0
West South Central	4,469	3,592	+ 24.4	2,082	1,185	+ 75.7	3,222	1,437	+124.3	46.6	33.0	+ 41.2
Arkansas	576	521	+ 10.6	147	77	+ 89.7	392	135	+189.8	25.5	14.8	+ 72.3
Louisiana	780	619	+ 26.0	357	187	+ 90.5	553	250	+121.6	45.7	30.2	+ 51.3
Oklahoma	715	647	+ 10.5	391	268	+ 46.1	528	273	+ 93.3	54.7	41.4	+ 32.1
Texas	2,398	1,805	+ 32.9	1,187	653	+ 81.9	1,749	779	+124.6	49.5	36.2	+ 36.7
Mountain	1,616	1,239	+ 30.5	521	255	+104.4	1,223	698	+ 75.3	32.2	20.6	+ 56.3
Arizona	241	147	+ 63.9	98	34	+185.5	166	81	+103.9	40.9	23.5	+ 74.0
Colorado	438	355	+ 23.6	166	101	+ 64.5	329	208	+ 58.5	37.9	28.4	+ 33.5
Idaho	190	153	+ 24.1	1	2	— 68.8	163	98	+ 67.4	0.3	1.0	— 70.0
Montana	195	177	+ 10.0	70	43	+ 64.4	149	97	+ 53.4	36.0	24.1	+ 49.4
Nevada	58	37	+ 56.3	4	3	+ 44.4	39	21	+ 84.3	6.8	7.3	— 6.9
New Mexico	200	146	+ 37.4	73	23	+216.1	134	38	+255.6	36.4	15.8	+130.4
Utah	201	147	+ 36.6	70	26	+166.5	176	117	+ 50.2	34.8	17.9	+ 94.4
Wyoming	93	77	+ 21.2	39	23	+ 68.3	67	38	+ 74.6	41.5	29.9	+ 38.8
Pacific	4,950	3,301	+ 50.0	2,708	1,777	+ 52.4	3,996	2,484	+ 60.9	54.7	53.8	+ 1.7
California	3,609	2,341	+ 54.2	2,529	1,624	+ 55.7	2,931	1,788	+ 64.0	70.1	69.4	+ 1.0
Oregon	526	370	+ 42.4	105	87	+ 20.8	418	249	+ 68.1	20.0	23.6	— 15.3
Washington	815	590	+ 38.0	74	66	+ 12.9	647	447	+ 44.6	9.1	11.1	— 18.0

Sources: American Gas Association, Bureau of Census, Edison Electric Institute.

[a] Dwelling units as of April 1, [b] Preliminary, [c] Customers as of March 31, 1950 and January 1, 1940.

Note: LP residential gas customers are not included.

Equitable Gas surveys commercial customers

REPORTS from Pittsburgh show that Equitable Gas Company has completed probably the first 100 percent survey of commercial gas customers ever conducted by a large utility company. The study ties in closely with a major objective of American Gas Association's current interim service program to Keep 'Em Cooking with Gas (a PAR Plan activity).

Fifteen specially trained, temporary employees have made over 18,000 calls on Equitable Gas' commercial customers. The census was planned and conducted under direction of F. B. Jones, manager of the company's economic and management research department.

Completed market data from the survey should provide the sales department with a true picture of the competitive situation in commercial cooking, water heating and various other process loads. It will enable the company to make more accurate estimates of future commercial gas load requirements than ever before.

Under the current A. G. A. program to Keep 'Em Cooking with Gas, member companies are encouraged to conduct surveys of commercial kitchens. Objectives of such studies are to determine the status of equipment—whether it needs replacement or not—and to measure the inroads of competitive equipment.

The Keep 'Em Cooking with Gas program is designed to prepare the way for a hard-hitting Proof of Profits Campaign at a later date.

Independent Natural Gas men elect Kayser

PAUL KAYSER, president, El Paso Natural Gas Co., El Paso, Texas, was elected president of Independent Natural Gas Association of America during the annual one-day meeting on October 23. Approximately 200 executives of the natural gas industry attended the session in the Rice and Shamrock Hotels in Houston.

C. P. Rather, president, Southern Natural Gas Co., Birmingham, Ala., was elected first vice-president, and John F. Merriam, President, Northern Natural Gas Co., Omaha, second vice-president. Reelected were F. W. Peters, Oklahoma Natural Gas Co., Tulsa, as treasurer; John A. Ferguson, executive director, and W. E. Disney, general counsel.

U. S. Senator Lyndon Johnson from Texas was the first speaker. As chairman of the Senate Armed Services Preparedness Committee, he spoke on "Resources Defend America." Following this address were speeches by Senator Edwin C. Johnson, Colorado, chairman of the Senate Committee on Interstate and Foreign Commerce, and Mon C. Wallgren, chairman, Federal Power Commission.

The afternoon round-table discussion featured Scott Hughes, vice-president, Southern Union Gas Co., Dallas; Marshall Newcomb, general counsel, Lone Star Gas Co., Dallas, and Paul Kayser, who shared views on "Common Carrier Natural Gas Pipelines." A motion picture sponsored by Transcontinental Gas Pipe Line Corp., Houston, was shown to members before they adjourned.

Tennessee Gas Transmission Co., Houston, Transcontinental Gas Pipe Line Corp., and El Paso Natural Gas Co. were hosts at the annual dinner.

Harrisburg reviews century of progress

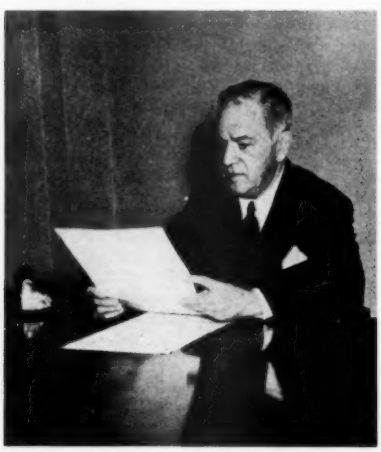
ONE HUNDRED YEARS OLD this year, The Harrisburg Gas Co., Harrisburg, Pa., looks back on a century of achievement. Many of the most interesting accomplishments are described in the company's anniversary booklet "A Century of Public Service."

Gas was a new, unproved source of illumination when the company was founded. In some sections of the country proposals to light the streets with gas were met by a worried citizenry. "The fear of darkness will vanish, and drunkenness and depravity increase," an article in a New England paper declared.

Today, The Harrisburg Gas Company sometimes delivers more gas in two minutes than in an entire day in the early 1850's. Distribution mains have increased from two miles to approximately 180, including a 20-mile line for delivery of natural gas. Gas sold to customers has risen from 100 million cubic feet at the beginning of the Twentieth Century to an approximate annual rate of three billion cubic feet. Capital investment has grown from the original $60,000 total to nearly $11,500,000. By the end of 1950, about $5 million of this amount will have been expended on a four-year construction program to meet vastly expanded demands for gas service by customers.

These and other accomplishments are a proud heritage for President L. B. Richards and the company's 250 employees and 16 retired members.

Brooklyn wins Oscars



Clifford E. Paige, president and board chairman, The Brooklyn Union Gas Co., examining advertisement which won two Oscars of Industry in Financial World Magazine's annual report contest. Brooklyn's entry was voted best annual report advertisement directed by an American business institution to its community. Same advertisement won prize as the best in the public utility industry

Rocky Mountain group studies appliances

H. LEIGH WHITELAW, managing director, Gas Appliance Manufacturers Association, was principal speaker at the seventh annual banquet of Rocky Mountain Gas Association. Several hundred members attended the meeting on September 18 in the Shirley-Savoy Hotel in Denver.

In his talk, "What's Ahead in the Gas Appliance and Equipment Business?" Mr. Whitelaw noted that despite greatly increased usage, proved reserves of natural gas today are about 12 times as great as they were 30 years ago. He called attention to the fact that the vast network of natural gas transmission lines in the United States now exceeds by far the entire mileage of the country's railroad systems. This figure, he added, does not include distribution systems of local utilities.

Mr. Whitelaw also discussed the importance of a continuing steel supply for manufacturers of gas appliances and equipment. His statistics showed that total requirements of the industry are insignificant in comparison with the amounts available. He was optimistic about an adequate supply of steel and other critical materials necessary to keep up with gas appliance shipments, which increased from 50 to 100 percent in 1949.

Officers of the Rocky Mountain Gas Association are: President—S. J. Neely, North Denver Furniture Co., Denver; Vice-president—Dick Tanner, Security Heating Co., Denver, and D. A. Bell, Bell Plumbing & Heating Co., Denver; Secretary-Treasurer—Roy G. Munroe, Public Service Co. of Colorado.

Here's one for the record book

THERE ARE numerous cases on record of two or even three generations of families working in the same utility. But a new record has been set by the Connolly family at The South Carolina Electric & Gas Company.

When John P. Connolly, Jr., joined the company recently as a chemical technician he was the fourth generation to serve with the utility. Bernard Connolly, who entered the company's employ in 1849, was his great grand uncle. William J. Connolly, who served the company for 49 years beginning in 1881, was his grandfather. His father, John P. Connolly, Sr., is currently sales manager and has been with the South Carolina company since 1911.

OBITUARY

John F. Shaw

vice-president in charge of engineering and production, Seattle Gas Co., Seattle, Wash., died on November 21.

Mr. Shaw was well known in the industry and was a member of American Gas Association. He was born in Terre Haute, Ind., on March 31, 1903, and graduated from Rose Polytechnic Institute in 1928 with a degree in mechanical engineering. He joined the gas company in 1933 and assumed the vice-presidency in 1947.

P. S. Young

retired chairman of the executive committee, Public Service Corp. of New Jersey, died November 15 in a hospital in Glen Ridge, N. J. He was 79 years old.

Mr. Young was a former president and for many years a director, American Gas Association. In addition, he had been president of National Commercial Gas Association, Eastern States Gas Conference, American Electric Railway Accountants Association, as an officer of several other leading trade associations. He served the New Jersey utility for 44 years before retiring in 1947.

Born in London, he was brought to the United States as a youth and was graduated from New York University in 1908. At the time, he had been in the utility field since 1890, when he began as a collector for an Omaha, Neb. concern. He was with The United Gas Improvement Co., later became assistant secretary of Hudson County Gas Co., Jersey City, and was the first comptroller of Public Service when it was formed in 1903. He was a vice-president and director of the utility in 1917-39, thereafter becoming executive committee chairman.

Surviving are his wife, Mrs. Grace Mason Young; four sons, Percy S. Jr., George W., William C. and Thomas R. Young, and four daughters, Mrs. Malcolm Warnock, Mrs. Robert B. Cheney, Mrs. Gordon B. Davis and Mrs. Leonard L. Shertzer Jr.

George W. Bean

from 1932 to 1946, Washington representative of American Gas Association, died at his home in Washington, D. C. on November 20. After his 15 years as fuel consultant for the gas industry, Mr. Bean resigned to engage in individual representation work, while continuing to be available for specific retention by individual utilities.

A well known figure on the the national scene, Mr. Bean was the holder of a high decoration from the Cuban government for his life-long activities in behalf of the island's people. He was also a leader in Florida politics and from 1916 to 1928 served on the Republican National Committee.

Surviving are his wife, the former Helen MacGeorge, of New York; a daughter by a former marriage, Mrs. Gladys Holdstock, of Tampa, Fla.; a brother, H. F. Bean, of Mobile, Ala.; three sisters, Mrs. Lulu Colman, of Anna Maria, Fla.; Mrs. Mary Hall, of Hartsdale, N. Y., and Mrs. Edith Littlefield, of Blackshear, Ga., and a granddaughter.

Frederick C. Freeman

—former president of Providence Gas Co., Providence, R. I., and for many years a director of American Gas Association, died November 6 in a Rhode Island hospital after an operation. He was 68 years old.

A native of Jersey City, Mr. Freeman was a consulting engineer with The United Gas Improvement Co., Philadelphia, before moving to Providence in 1919. In addition to his service with American Gas Association, he was a president of New England Association of Gas Engineers and later president of New England Gas Association.

Casualty insurance

(Continued from page 6)

responsibility—Experience has proven the unquestioned advisability of centralizing the responsibility for all insurance matters with a single executive or executive committee. If, in exceptional cases, "Personnel" coverages such as Compensation, Group Life, Pensions, etc. are handled by the personnel or industrial relations department, while the other forms of insurance are handled perhaps under the "treasury" department, extremely close cooperation between the two departments is mandatory.

The last but not least executive obligation is to select a qualified insurance adviser to execute the insurance program. He must be acquainted with the broad application of the insurance market, and whatever special forms of insurance contracts are available from the insurance market in its entirety. He must know how to measure insurance risks and adequately interpret them into policy conditions at minimum appropriate costs. He must enlist and supervise the insurance company's engineering services. He must render any needed service as the insured's representative in connection with loss adjustments.

Unfortunately, the term "Comprehensive Public Liability" is used somewhat loosely in the insurance industry and there is no such thing as a uniform policy. Basically this is a blanket form of Public Liability Insurance, which has come into general use within the past ten years. As some corporations are still buying liability insurance on the old-fashioned, ill-advised specific cause basis, we point out that the Comprehensive Liability form incorporates into a single broad policy what was formerly bought separately under:

(1) Manufacturers Public Liability; (2) Owners, Landlords and Tenants Liability; (3) Elevator Liability; (4) Independent Contractor's Liability also known as Owners Contingent or Owners Protective Liability; (5) Contractual Liability; (6) Teams Liability; (7) Products Liability.

The Comprehensive Public Liability Policy, as designed and used by members of the National Bureau of Casualty and Surety Underwriters, is intended to cover the normal type of risk whatever that might be. However, in designing insurance for the gas industry, we must either prepare a manuscript policy or thoroughly endorse the basic policy form so as to fit the needs of the gas industry.

Examining the Insuring Agreements, we find that the policy covers liability imposed by law or assumed under contract, as defined in the policy, for Bodily Injury and Property Damage caused by accident. We must amend this so as to provide that the Bodily Injury Coverage is on an occurrence basis to take care of such claims as arise, for example, in connection with alleged injuries to health from the constant vibration experienced by a householder in the vicinity of a compressor station. There have been instances during an exceptionally severe winter when it has been necessary to deliberately reduce pressure or discontinue domestic service to the point where homes could not be heated or kitchens used. There resulted a whole series of claims for alleged illnesses none of which would be covered if the Insuring Agreement were limited to "caused by accident."

Until just a few years ago it was possible to buy the liability for Property Damage on an occurrence basis. However, in the past few years some of the insurance companies have suffered such severe losses that it is now most difficult to delete "caused by accident" from the Property Damage Insuring Agreement. In some instances the insurance company

may be persuaded to effect such coverage provided the limit of liability of Property Damage on an occurrence basis is restricted to a comparatively small amount.

The language of this printed form includes liability assumed under contracts as defined. The definition of contract is limited to the warranty of products or, if in writing, a lease of premises, easement agreement required by municipal ordinance, sidetrack agreement, or elevator or escalator maintenance agreements. It is imperative to arrange the coverage on the basis of automatic blanket contractual liability for all written contracts or agreements. The importance of this cannot be over-emphasized in light of the very serious liability assumed, for example, in connection with railroad crossings or underpasses.

Executive officers, directors, and stockholders of the corporation are included in the definition of insured, and some corporations desire to extend this to cover the liability of employees while acting within the scope of their duties as such.

The second and next important portion of this so-called standard policy form is the exclusions. First, is the exclusion of watercraft while away from the premises of the insured. Many corporations have overlooked the fact that they have a row boat or motor boat or even a small barge, which they own and use in connection with perhaps a river crossing. For an appropriate premium this exclusion, can of course, be deleted. If a very large vessel is involved it would be more appropriate to cover the risk under a form of marine insurance known as Protection and Indemnity Insurance.

Some of the pipeline companies in particular own and operate aircraft. It is usually advantageous to arrange the aircraft liability as well as the aircraft non-ownership coverage separately in the Aviation Insurance market. Great care should be exercised, however, to make certain that contingent aircraft liability is afforded under the Comprehensive General Liability Policy for no additional premium.

Next is the exclusion with reference to damage to property occupied by, used by, or rented to the Insured. For the past several months much has been written in the press concerning Fire Legal Liability with particular reference to subrogation by fire insurance companies. The very recent reversal of the Decision in connection with the General Mills Case has taken us back to where the current furor started. There has been far more smoke than fire in connection with this subject. There has been no complete reversal of policy on the part of the fire insurance companies and they have not adopted any general practice of exercising their rights of subrogation. In most cases, the subrogation has actually been instituted by the policyholder due to insufficient insurance or the effect on his future fire insurance costs. The subject cannot be ignored but we suggest that the exploratory rates, which are being charged currently by both fire and casualty insurers are quite out of line with the exposure in most instances. Each corporation should carefully analyze its exposure to loss in comparison to the cost of insurance and then arrive at a decision.

One of the most moot questions in Public Liability Insurance is the interpretation of the Property Damage Exclusion, with reference to property in the care, custody and control of the insured. This exclusion should be very thoroughly examined and discussed with your insurance adviser in order that the liability coverage may be properly dovetailed with fire and marine insurance.

Some policies include an exclusion for property damage caused by certain types of water damage. This may be of consequence where one leases a portion of a multiple tenant building.

Last, but not least, there is a whole group of special property damage exclusions, which some insurance companies insert in their gas utility policies. Specifically, we refer to the following so-called "Exclusions:" explosion damage; damage to underground wires; damage due to collapse; underground or subsurface damage; damage due to cratering or blowout of wells. If any of these exclusions appear in any of your policies, they should be examined critically with reference to your particular operations and eliminated. This is also true in connection with Public Liability policies carried by any independent contractors doing work on your behalf.

One of the most frequent questions we are asked is, "What limits of Public Liability Insurance should we carry?" Obviously, this is entirely a matter of judgment and is related not only to the exposure to loss, but to the financial structure of the corporation. There is almost no limit to the mathematical potential of loss when we think in terms of the concentration of people in public gatherings or the catastrophic spread of fire. It is our personal opinion that no gas utility, regardless of size, can afford to have less than the equivalent of $500,000 combined Bodily Injury and Property Damage. Where higher limits of liability are indicated, it is quite often advantageous to arrange excess liability insurance riding on top of the primary insurance.

It used to be standard practice to apply separate rates to payrolls, sales, elevators, volume of work let under independent contract, etc. under Comprehensive General Liability policies. Today many of the states have authorized the use of a single composite rate, the basis for which may be selected to fit your particular needs. For example, it may be payroll, or gross operating revenue, or even million cubic feet of gas sold.

This discussion would not be complete without touching upon the subject of self-insurance. Subject to a lot of big "ifs," self-insurance may have a proper place in the program of the large corporation.

However, the subject must be approached with a careful and critical examination of such factors as:

A. Can claims be handled as cheaply by the corporation as by the insurance company, taking into consideration such factors as the geographical spread of the risk the cost of investigation, the cost of litigation?

B. Is it practical to immediately establish an adequate reserve fund out of which to pay normal losses regardless of frequency? What about taxes on this reserve fund?

C. Does the sacrifice of loss prevention services and inspections mean anything?

D. Since an unlimited loss reserve fund is out of the question, it is mandatory that catastrophe insurance be purchased. Has the cost of this insurance been taken into consideration?

In any event it will be evident that self-insurance is prudent only for the exceptional and very large operator.

The subjects of insurance coverage, rates, rating plans, excess insurance and self-insurance are indeed complicated. There is not an organization in your industry that doesn't submit the simplest lease or license agreement to legal counsel. Remember that your insurance policies are legal contracts involving tremendous potential losses. As such, you cannot afford to be without the services of insurance counsel at all times.

Forbes heads A.G.A. rate committee

ARTHUR H. FORBES, rate engineer, The East Ohio Gas Co., Cleveland, Ohio, has been appointed chairman of the Rate Committee, American Gas Association, for the 1950-1951 Association year. The committee's duties include making studies of the various costs involved in supplying gas to different classes of customers, recommending forms of rates designed to meet most equitable distribution of such costs and at the same time to secure adequate and just revenue.

Mr. Forbes was graduated from Case Institute of Technology in 1921 with a degree of Bachelor of Science in Civil Engineering. From 1921 to 1931, and in 1935 he was in the construction industry, both in the field and on design, on commercial and industrial buildings, steel mills, bridges and power plants. From 1931 to 1934 he was engaged in public utility valuation and rate work on rate cases before the Ohio and Kansas commissions involving The East Ohio Gas Company and Cities Service Gas Company. Mr. Forbes also did valuation work on the properties of some of the subsidiaries of Associated Gas and Electric Company.

He joined The East Ohio Gas Company in February 1936 as assistant rate engineer and was promoted to his present position of rate engineer in May 1947. He also serves as rate engineer for The River Gas Company.

A. H. Forbes

New officers for GAMA marketing group

D. R. MECKSTROTH, director of sales research, Servel, Inc., Evansville, Ind., has been elected chairman of the general marketing committee, Gas Appliance Manufacturers Association.

L. O. Reese, vice-president and general manager, Armstrong Products Corp., Huntington, W. Va., has been elected vice-chairman of the committee.

Mr. Meckstroth, who served as vice-chairman last year, graduated from Indiana University in 1941 with a BS Degree from the School of Business. He has been employed by Servel in the sales division since his graduation, with the exception of three years duty in the Naval Reserve. He is a member of American Marketing Association and Evansville Sales Executive Club.

Personal and otherwise

Rabold elected Kentucky official

HUGH M. RABOLD has been elected assistant secretary and appointed general auditor, Kentucky West Virginia Gas Co., Ashland, Kentucky. He will have charge of accounting and general records of the company.

Mr. Rabold attended Ogden College at Bowling Green and Bowling Green Business University. He entered the employ of Louisville Gas and Electric Co., Louisville, Ky., in 1926, in the accounting department. He was transferred to Kentucky West Virginia Gas Company at Ashland, Ky., in January 1928 when Kentucky West Virginia's general offices were opened there. At the time of his present appointment, he was auditor for the company, a post which he has held for 12 years.

Mr. Rabold is a member of National Office Management Association.

H. M. Rabold

American Natural appoints

THOMAS K. HUMPHREY has been elected vice-president and secretary of American Natural Gas Company. He will have charge of the home office of American Natural Gas Company at 165 Broadway, New York, N. Y.

Prior to his present appointment, Mr. Humphrey was vice-president and secretary, United Light & Railways Co., until the latter company recently completed its liquidation.

Kohlhepp joins national production group

CHARLES E. KOHLHEPP, president, Wisconsin Public Service Corp., has joined National Production Authority as a consultant to assist with organization of the program bureau.

Mr. Kohlhepp has been associated with Wisconsin Public Service Corporation for the past thirty years. He is a member of American Gas Association.

For some time during World War II, Mr. Kohlhepp served in the War Production Board, first in the Office of War Utilities, and then as director of the program bureau and vice-chairman of the requirements committee.

New counsel in Omaha

GEORGE C. PARDEE has been appointed general counsel for The Metropolitan Utilities District, Omaha, Neb., succeeding Dan B. Van Dusen, retired. Mr. Pardee is currently secretary of American Gas Association's Midwest Personnel Conference.

Philadelphia Electric names counsel

SAMUEL GRAFF MILLER has been appointed assistant general counsel, Philadelphia Electric Company. Mr. Miller has been associated with the utility since 1947, prior to which time he was engaged in private law practice in Harrisburg. For several years he held the position of assistant counsel of Pennsylvania Public Utility Commission at Harrisburg.

After graduation from Princeton, Mr. Miller studied law at Cambridge University, England, prior to receiving his law degree at University of Pittsburgh.

Brooklyn Union honors meritorious service

TWENTY-SEVEN employees of The Brooklyn Union Gas Company received awards on November 2 for meritorious actions benefiting the company or the community. Guests at the special emblem dinner included 295 men and women who have served the company for 25 years or longer.

President Clifford E. Paige officiated and paid special tribute to Martin J. Dalton, winner of American Gas Association's Meritorious Service Award. This top honor is conferred on the person performing the most meritorious action in the gas industry during the year.

A. G. A. McCarter Awards for successful resuscitation were presented to Matthew A. Givens, Samuel Kaniuka, Patrick F. Kennedy, Frank J. Ratigan, Thomas P. Reilly, and James J. Teer, Jr. Gaspar Bavetta and Frederick Reitz received McCarter Certificates for assisting in these emergency situations.

Heading the list of those honored for long service was Robert J. Campbell, retired, who received a diamond-studded service emblem bearing 14 stars, denoting 70 years of service. This is the first time a Brooklyn Union employee has been eligible for that award. President Paige noted that 1,432, over 28 percent of Brooklyn Union's employees, have been with the company for 25 years or more.

New sales manager for Consumers Gas

WILLARD E. COLVIN, formerly of Scranton, Pa., has been named sales manager for Consumers Gas Company in Reading and Berks County. Mr. Colvin succeeds Gordon M. Jones who is moving to Philadelphia to take charge of sales and sales promotion for the subsidiary companies of The United Gas Improvement Company in the eastern Pennsylvania area. Roy A. Stoner has been named assistant sales manager for Consumers Gas Company.

Mr. Colvin was formerly district manager in eastern Pennsylvania for Geo. D. Roper Corp., gas range manufacturing firm in Rockford, Illinois. He is a graduate of Brothers College, Drew University, Madison, New Jersey

Mr. Stoner has served with Consumers Gas Company for more than 40 years. Starting with meter reading, he worked his way up to house heating engineer and now assistant sales manager. He is a former president, Metropolitan Philadelphia House Heating Council. Mr. Jones and Mr. Colvin both are members of American Gas Association.

W. E. Colvin

Sargent personnel chairman

DWIGHT S. Sargent, personnel director, Consolidated Edison Co. of New York, Inc., has been appointed chairman of the American Gas Association Personnel Committee.

D. S. Sargent

Objective of the Personnel Committee is to study and report on industrial relations as they apply to the gas industry. Mr. Sargent has a broad knowledge of the varied facets of gas utility industrial relations. His work on the committee should help to keep the industry acquainted with latest developments in the field of personnel and industrial relations.

Kentucky vice-president

HERBERT L. LEY has been appointed vice-president in charge of operations at Kentucky West Virginia Gas Co., Ashland, Kentucky.

Mr. Ley is a graduate of University of Pittsburgh. He joined Kentucky West Virginia Gas Company in 1928 as a field agent, after about four years with Duquesne Light Company and Equitable Gas Company. He has since served the Kentucky Company as land agent, general superintendent, and manager of construction and operation.

Equitable appoints Nist

C. H. NIST has been appointed assistant to the president, Equitable Gas Co., Pittsburgh, Pennsylvania.

C. H. Nist

Mr. Nist joined Equitable Gas Company in February 1924 as a clerk and stenographer. He later was made secretary to the vice-president and general manager, and office assistant to the president, in which capacity he was serving at the time of his present appointment.

Nashville names Hinch

RICHARD L. HINCH, Kansas City, Mo., has been appointed controller for Nashville Gas and Heating Co., Nashville, Tennessee.

Mr. Hinch was formerly connected with Conversions and Surveys, Inc., a subsidiary of Stone and Webster Service Corp., New York. Prior to that, he was associated with Central Illinois Electric and Gas Co., Rockford, Ill.; Fall River Gas Works Co., Fall River, Mass., and Trans World Airline, Kansas City, Missouri. Mr. Hinch is a graduate in accounting of Northwestern University.

Newark promotion

CHARLES R. DEWHURST, Public Service Electric & Gas Co., Newark, N. J., has been named superintendent of industrial relations.

A graduate of Yale University, Mr. Dewhurst started with the company as a cadet engineer in September 1926. After a series of promotions, he became assistant engineer of construction in the general office in December 1947. Mr. Dewhurst is a member of American Gas Association.

Louisiana Natural appoints

EWELL F. HINDMAN has been appointed general manager of Louisiana Natural Gas Corporation.

E. F. Hindman

Mr. Hindman, a veteran of many years experience in the natural gas industry, joined Louisiana Natural in 1949 as pipeline superintendent and continued in that post until his latest promotion. Prior to that, he worked for 20 years with Arkansas-Louisiana Gas Company in several capacities, including gas measurement, operations and leakage engineering.

Consolidated Edison elects vice-president

HARRY J. BAUER has been elected a vice-president of Consolidated Edison Co. of New York, Inc. Mr. Bauer will be in charge of purchasing and stores, fuel and commercial buildings and will retain his present post as president of New York Steam Corporation, a subsidiary of Consolidated Edison.

The departments reporting to Mr. Bauer, effective November 1, formerly were under the direction of John H. Aiken, Consolidated Edison vice-president. Mr. Aiken on November 1 will take over direction of the sales and commercial relations activities of Consolidated Edison. He has been president of New York Steam since May 1946.

Mr. Bauer received his mechanical engineering degree from Stevens Institute of Technology in 1918. He is a member of the executive committee of the Institute's alumni association.

H. J. Bauer

Wave lengths

(Continued from page 17)

—more information on what people can expect of the economic system, and why they cannot expect more at the moment. Perhaps we do need to extend our communications programs to give employees opportunities to become better versed in basic economics, whatever the risks may be. If that is so, I'd like to suggest these three considerations:

(1) Education in basic economics should be a voluntary project. We should attempt to create a real desire for the opportunities associated with such study groups. Our supervisory personnel ought to welcome participation in such study groups as one means of becoming better supervisors.

(2) Only by conference discussions, active participation, investigation and analysis, giving individuals the opportunity to relate problems to their own experiences, giving them a feeling that they are reaching their own conclusions and not accepting the dicta of others, can we

truly hope to affect attitudes and educate.

(3) In this most difficult area of economics we could well use the cooperation of our colleges and universities, or people equally qualified. In addition to material help, their participation should serve to remove any suspicion that the economics courses have been slanted to serve management's purposes.

We want our industry and our company to be successful. We want to render the very best utility service that any reasonable customer can demand, at fair, reasonable, and competitive prices. That's obvious. We need for that purpose an informed, understanding, cooperative organization. The time we spend, then, in improving our communications program, will be time well spent. This is a long-range project. We have got to find the wave lengths of our employees.

Communications in industry has a goal and is not in itself a goal. You and all other members of the management team —and not only top management and industrial relations people—have a stake in the attainment of that goal.

Appliance preview

(Continued from page 4)

pastel colored porcelain enamel. These finishes serve to dress up or brighten the kitchen space and should be very popular for either new homes or where old kitchens are being modernized. Range top burner layouts vary widely and are made with four, six and eight open burners. Also available in the range top are the griddle plates, which may be converted to top burners if desired, and deep well cooking compartments. Sizes of ranges available vary from the small 20-inch apartment house range with four top burners and oven and broiler below, to large 62-inch ranges with open broiler, large griddle plate, six open burners, and double oven. Intermediate sizes are available in models which will meet any price range the customer desires.

Cooking tops and the general range construction have been greatly improved in many instances from the point of view of ease of cleaning. This is especially evident in the reduction of joints on the top burner surfaces due to one-piece construction of burner top and aeration bowls. In addition, the burner grates are usually made of chrome or enameled steel. Oven compartments finished in white enamel also serve to make possible the maintenance of a cleaner oven.

One manufacturer who does much work in the field of custom built ranges displayed sectional oven, broiler, and top burner units which they hope to make available within a short time. These units may become very popular as they offer great flexibility in the location of the cooking units in the kitchen. With units of this type it is possible to separate the different sections and thereby locate them in the portion of the kitchen and at heights which offer the greatest convenience to the user. These sections can be built into table top or wall cabinet units and present many possibilities for new and better looking kitchen designs.

This manufacturer also features a disappearing shelf. This is raised from a handle at the back of the range until the shelf is all the way up and can then be brought forward and downward until it is level. The shelf is strong and rigid and will hold up to 25 pounds. It is particularly useful for warming plates, raising bread dough, or simply stacking plates for convenient food serving.

Also shown for the purpose of obtaining public reaction were ranges providing for the installation of radio or television units in the back splasher panel. While such ranges might at first glance appear to verge on the extreme, they do offer the unique feature of permitting cooking messages to be presented where they can be most effectively and immediately put into practical use. Such receivers are not put on the range for entertaining but for real value to the homemaker.

In order to secure public reaction, another manufacturer displayed a range equipped with an "oven viewer" built into and flush with the top section. This glass viewer is approximately 3" x 6" in size and would permit the user to observe the baking or roasting operations by merely glancing down at the viewer from a standing position. In conjunction with the viewer is an oven light controlled from a push button which permits a better observation of the oven interior. A feature of this type is designed purely to add to the convenience and ease of cooking with gas.

A feature which is not of direct importance to the user but is of prime interest to dealers and installers of gas range equipment is new universal gas top burner valves that have been marketed by a number of valve manufacturers. These gas valves permit convenient installation of gas ranges regardless of the type of gas supplied, as the proper burner orifice adjustments can be made without changing the entire gas valve.

Heating equipment manufacturers displaying at the Convention exhibited so many improved appliances that it is not feasible to try to enumerate in detail specific design changes. In general, however, the exhibition demonstrated that a tremendous variety of models and types of heating equipment is available to the potential gas heating customer. Units displayed are suitable for installation in the cellar, in utility rooms, in closets, in the floor, in the wall, in the room, in the attic, or from the ceiling. With this wide choice for the location of the heating system it should be evident that no one desiring the advantages that gas heating provides can fail to find an appliance that will satisfactorily meet his needs.

Though insurance records have shown year after year that gas heating is probably the safest way to heat a house, this exhibit included new and improved automatic safety controls aimed at making "safe" safer and "easy" easier. With them, lighting becomes more automatic and control failure less likely than before.

Where the unusual or difficult installation problem might have floored a heating engineer a few years ago, the many new variations of heating methods shown at this exhibit appear to cover every conceivable contingency. The most notable single advancement is the trend toward smaller and more compact units occupying a minimum of space, a feature of increasing importance in the home as well as the commercial heating markets.

One definitely new type of unit heater was displayed. This unit, mounted at the ceiling, is circular in shape and designed to distribute the heated air downward in all directions through a full 360° circumference. Heaters discharging warm air in this manner were previously available only with steam unit heaters. The advantage of this new design is that it permits more even heat distribution with a fewer number of heaters. Ease of installation for both horizontal and vertical flue outlets are provided.

A warm air furnace utilizing a new principle of air distribution attracted much attention. This unit circulates the warm air at a high temperature and a high velocity through small diameter ducts or pipes. Through use of special wall outlet registers it inspirates room air in sufficient quantity to reduce the discharge velocity and temperature to

that required for satisfactory and efficient room heating. From an installation viewpoint this type unit is highly desirable as it permits the installation of distribution ducts in small spaces which normally could not be utilized. For existing homes this feature enables the installation of a warm air heating system at reasonable cost.

Of interest to the gas utility company from the point of view of servicing is a new gas valve operating on the principle of electro-magnetic repulsion. It is intended for use on heating equipment in place of conventional solenoid valves. The new valve uses the principle of the induction motor for its operation and thereby develops its greatest lifting action when the valve is in the closed position. It is claimed that this initial lifting force is over twice that developed with a solenoid and will, therefore, reduce service calls due to sticking main gas control valves.

Another company has developed a solenoid valve which they claim will also eliminate gumming and sticking. A plastic fibre plunger boot is employed to keep the gas impurities away from the plunger and other moving parts. Only the valve disc comes in contact with the gas. The cause of many sticking valves is thereby minimized.

Demonstrating the trend toward compactness in design of heating controls as well as in the entire heating units was a combination control unit. This combines in a single unit a safety pilot, pressure regulator, pilot filter, main gas control valve and pilot valve. In addition, an electric or mechanical temperature control can be added to the device if automatic thermostatic operation is desired. This single compact unit, therefore, provides all the essential control devices normally required on an automatic heating control system with a big saving in space and external piping.

Package units

Of interest to the home owner who desires the luxury of all-year air conditioning are the package units which provide summer cooling in addition to controlled warm air heat in the winter time. Units of this type are now available from two manufacturers, with promise of more to come. One utilizes gas fuel for both summer and winter operation. The other uses an electrical compressor for summer operation but is gas-fired for cold weather heating.

This latter unit combines two half units that are readily attachable, forming an integral appliance, and are joined by a common plenum chamber. This plenum is adaptable for either direct discharge or for duct installation. All-year air conditioners, whether of the all gas or gas-electric type, are designed to provide the customer with the utmost in living comfort. A flick of a single switch is all that is required to change over from heating to cooling or vice-versa.

As in the case of heating appliances, manufacturers of water heating equipment have also improved their designs to give the consumer the utmost in efficiency and performance while keeping in mind the need for compactness and reasonable cost. Improved models of automatic storage, instantaneous, and multi-coil water heaters were everywhere in evidence. It was also evident that the manufacturers are making intensive efforts to build their units so as to provide greater durability and ease of servicing. The life of galvanized storage tanks used on the less expensive types of water heaters should be greatly lengthened with the almost universal adoption of magnesium rods which greatly reduce the rate of tank corrosion.

Of interest to the home owner who desires to install his water heating unit directly in the kitchen are the so-called table top models. These units, made in 20, 30, and 40 gallon sizes, are constructed with flat tops and are designed for installation in line with table height kitchen cabinet or sink units. One manufacturer showed a unit of this type which, due to its low burner input rating, need not be vented. In housing projects, water heaters are often specified merely by storage tank size without reference to recovery capacities. This has occasionally been a serious handicap for gas water heaters since they require a flue and the total installed cost thereby became higher than that of competitive equipment. Since competing equipment has low recovery capacities, this new type of gas water heater will provide a new means of securing the business. These heaters are designed for easy and attractive installation in the kitchen and offer great flexibility in unit location. When a flue is available they can be connected thereto or they may be placed so that the flue products will be picked up by the regular kitchen ventilation system.

Still another variation of the table top heater is the one designed for installation in a corner. A unit of this type will frequently permit the advantageous use of corner space which would normally be of little practical use.

The gas refrigerator again demonstrated the improved design features which have marked its progress since its introduction. The cabinet styling and interior layout of the freezer and storage compartments have been developed to a point where the home owner can now obtain the maximum in modern appearance and at the same time enjoy the convenience of a practical interior design. The unit features a quick change interior which in a matter of a few seconds can be rearranged to accommodate storage of different and unusual shaped food loads.

A number of models and types of home automatic dryer equipment were in evidence. Present models are as completely automatic in operation as anyone could desire. They incorporate such features as automatic temperature control, automatic pilot burners, automatic stopping and restarting of burners and tumbler when the dryer door is opened and closed, automatic gas pressure regulating controls and automatic shutdown of the unit at the end of predetermined operating time.

Advantageous load

As a result, it is now possible for the housewife to load the unit with wet clothes, start the dryer and proceed with other household chores. When the drying operation has been completed, the unit will automatically shut itself off without any danger of scorching or overheating the dry clothes. The modern gas units even come equipped with ultra-violet lamps which supplement the sterilizing effect of the drying process. As in the case of the home gas-fired incinerator, the gas load due to the use of dryers is particularly advantageous to gas utility companies because of its uniform year-round operation.

A number of manufacturers are now making household incinerators which make possible the convenient disposal of garbage and household waste. These incinerators utilize a small gas flame to dry out the waste material and subsequently incinerate it to a point where nothing remains but a small quantity of fine ash. Models are available which may be either manually or automatically controlled. The automatically controlled units are equipped with a timer which permits the user to set the burner operation for a given operating time.

How to supplement

(Continued from page 13)

hence a luminous flame is produced. Opening the supply cock to full open position caused all burner tips to resume normal performance.

By simultaneously opening the oil gas supply cock and closing the natural gas supply cock, the Columbia burner's gas supply was switched without losing the flames. This manipulation permitted observation of oil gas performance with all burner ports functioning normally. It was observed that the oil gas burned with a much harder and noisier flame. Upon decreasing the gas supply to about ¼ normal, all burners flashed back and burned in the spud. Full opening of the cock failed to cause any of the burners to recover and all burned at the orifices with a luminous, noisy and odorous flame. The gas supply was shut off and time was allowed for all burner flames to become extinguished. The supply cock was then rapidly opened to observe pilot ignition. The result was that about half the burners were flashed back and were again burning in the spud. Oil gas must be considered a complete failure as a substitute gas in this type of burner.

The effect of LP-air gas supplied to the Columbia burner was about the same as that for oil gas. The normal flame was quite luminous and sooty. The Columbia burner is constructed of multiple fixed Bunsen burners, cast integral in a ring manifold. The burners have a large barrel port area. It is apparent that primary air-gas mixture exit velocity will be low, making this type of burner susceptible to flash back when using gases having higher rates of flame propagation than natural gas.

Another type of space heating burner included in the demonstration was the Roberts Gordon burner. This appliance is characterized by having a single Bunsen type burner with a target over the exit port. The air shutter adjustment was set so as to give the burner a soft flame with natural gas. By some very determined effort it was possible to make the burner flash back on natural gas, but on opening the throttle to the wide open position the flame recovered and burned with a quiet, soft blue flame. The supply valves were then switched and oil gas was supplied.

In opening the burner cock, the oil gas was ignited from the pilot and burned with a flame considerably harder and noisier than with natural gas. Slow closing of the burner cock invariably caused flash back and burning at the spud. Rapid opening of the burner cock occasionally produced recovery. A sluggish solenoid, or leaking valve, will also result in intolerable performance and customer complaint. While it did not occur during the demonstration, it is quite possible that a sharp flash back could extinguish the pilot.

LP-air gas on this appliance burned with a noisy flame having the short blue cone of a hard flame, and bright, luminous yellow tips in the outer mantle. The Roberts Gordon burner was just as subject to flash back on LP-air gas as it had been on oil gas, but showed a greater tendency to recover. The latter could be expected because of slower rate of flame propagation of LP-air gas. Performance of these substitute gases on this type burner must be rated a failure. Its use will definitely result in customer complaints.

The Barber burner is similar in design principle to the Columbia except that it had smaller Bunsen type burners and more of them. It also differs in burner arrangement; the burners being arranged in four concentric rings with the burners in each pair directed so as to cause the flames to impinge on each other. The Barber tips installed on the appliance were designed for natural gas and burned with a hard blue flame. The flames showed some tendency to lift. Flame stability is obtained by impingement. Turndown, when supplied with natural gas, caused the flames to become luminous. Under this condition the burner resembled (for lack of a better description) a birthday cake. On resumption of full gas flow, the flames recovered and burned normally.

When oil gas was supplied this burner showed a tendency to flash back, but when gas was turned on full there was nearly complete recovery. One or two tips operated with a squirting, yellow flame. LP-air gas functioned in about the same manner as oil gas but with more noise. Turndown resulted in flash back, and reopening of the cock caused almost complete recovery. Under actual operating conditions the Barber tips would become hot and show less tendency to recover from flash back.

Final step

Natural gas, oil gas and LP-air gas all performed very well on the ribbon type space heater burner. These burners were mixed gas type burners with very small port openings. Substitute gases can be expected to burn with a very noisy, but otherwise tolerable, flame on a ribbon burner designed for straight natural gas.

The final step in the demonstration in this section dealt with interchangeability of natural gas on an LP-adjusted appliance. To show this, a three-burner hot plate was supplied with 1,200 Btu propane-air and the burners adjusted hard, normal and soft. The burner was then switched to natural gas without extinguishing the flames. All burners, regardless of hard, soft or normal adjustment had almost identical flames. All were normal and completely satisfactory. It demonstrates that natural gas is a satisfactory substitute gas for oil gas and for LP-air gas.

To further emphasize this concept of interchangeability in one direction, but not in the other, a similar hot plate supplied with natural gas was adjusted hard, normal and soft (located in the rear room). Admission of LP-air gas resulted in the hard burners flame blowing off, the normal acquiring yellow tips, and the soft becoming intolerably yellow and soot forming. This coincided with observation made on the Magic Chef and Garland ranges but was more pronounced due possibly to a difference in burner characteristics.

C—Demonstration in rear room

This part of the demonstration deals principally with the study of substitute gas mixtures. As a preliminary, however, all appliances were demonstrated with the three base gases, natural gas, oil gas and LP-air gas. The following appliances were used in the order listed:

(1) A three-burner hot plate equipped with Milwaukee type orifices and adjusted hard, normal and soft on natural gas.

(2) Two Electrolux refrigerator burners; the first adjusted soft, the second hard on natural gas.

(3) A Barber water heater burner equipped with natural gas tips.

(4) An apartment-size Magic Chef range equipped with the replacement burner heads which were used in the Milwaukee natural gas conversion. Three burners adjusted hard, normal and soft on natural gas.

(5) A Bunsen burner board with two six-unit banks. Both banks were

given a graduated adjustment on natural gas ranging from the hardest possible setting to soft with a trace of yellow tips. (See Figure 4) This is same apparatus as was used in the initial demonstration; however, it was connected in such a manner that the gas source for the left side was oil gas and the right side burned the gas mixtures.

(6) A 1925 Penninsular range with three star burners adjusted hard, normal and soft on natural gas. These burners had characteristics very similar to the hot plate.

Following gas mixtures were tested:

(a) 30% coke oven gas—70% natural gas.
(b) 35% oil gas—65% natural gas.
(c) 25% LP-air gas—75% natural.
(d) 30% coke oven gas—70% oil gas.
(e) 50% coke oven gas—50% LP-air gas.
(f) 50% oil gas—50% LP-air gas.
(g) 20% LP-air gas—35% oil gas—45% natural gas.
(h) 11% propane vapor—30% oil gas—34% coke oven gas—25% natural gas.

All of the appliances in the rear room were operated with each of the three single constituent gases, natural gas being first so as to establish a standard of comparison. The hot plate provided no new data since it had been used in a previous demonstration. The Electrolux burners were the next to be observed. On oil gas the soft burner gave a yellow odorous flame, the pilot did likewise. The hard Electrolux burner merely became harder on oil gas but remained satisfactory on both "freeze" and "defrost" settings. The results on LP-air gas were much the same, except that the yellow flame became more yellow and the hard flame harder, but still tolerable.

The Barber water heater burner functioned in the same manner as the space heater burners did on natural gas, oil gas and LP-air gas. There was lifting on full throttle for all gases, and noisier operation with oil gas and LP-air gas. Turn down resulted in flash back for oil gas and LP-air gas but with complete recovery at full flow.

The Magic Chef apartment size range with Milwaukee replacement burners exhibited behavior on the three gases quite similar to that of the Magic Chef (CP) range of the front room. Oil gas caused the hard flame to become slightly harder with some difficulty of ignition. The normal flame remained normal but a trifle harder and soft flame displayed an insignificant increase in yellow tip size. LP-air gas ignited with difficulty on the hard adjusted burner, but was satisfactory on the normal burner and was yellow and soot forming on the soft burner.

The 1925 Penninsular range burning oil gas showed a satisfactory flame on the hard adjusted burner, a tolerable flame with traces of yellow tips on the normal burner and an intolerable yellow soot forming flame on the soft burner. LP-air gas produced a sharp, difficult to ignite flame on the hard burner, a yellow tipped flame on the normal burner and an intolerably yellow and soot forming flame on the soft burner.

This concluded the demonstration with straight natural gas, oil gas and LP-air gas, on the appliances in the rear room. The next and final phase of the demonstration dealt with application of gas mixtures.

Mixture (a)—30 percent coke oven gas —70 percent natural gas

A mixture of 30 percent coke oven gas and 70 percent natural gas was admitted to the appliance manifold. The Bunsen burner board was employed to give an indication of the utilization range. This apparatus had been used previously to compare straight substitute gases with natural gas and it retained the same graduated adjustment obtained with natural gas, but was connected to burn oil gas on the left bank and either natural gas or one of the mixtures on the right bank. The purpose of this arrangement was to assist the observer in making a comparison between the utilization range of straight oil gas and the mixture in question. For mixture (a) it was seen that the utilization range differed little from that of straight natural gas.

The burners of the hot plate were ignited and the character of the flames noted. No difficulty was encountered in lighting the burners and little difference could be detected between these flames and the flames of straight natural gas.

The Electrolux burners functioned in the same manner as when natural gas was being burned on both the hard and soft burners. The flame on defrost setting also was identical to that of natural gas.

The Barber water heater burner did not flash back, nor did it have flames with yellow tips on turn down.

The apartment-size Magic Chef had essentially the same flames on each burner as with natural gas.

Mixture (b)—35 percent oil gas—65 percent natural gas

The same sequence of operations was carried out. The mixture was burned in the right bank of the Bunsen burner board and utilization range compared with oil gas burning on the left bank. Five of the burners functioned satisfactorily on the mixtures. This compared with three burners being unsatisfactory on straight oil gas. Burner No. 6 gave more evidence of yellow tips and burner No. 1 was quite sharp on the mixture; whereas the bank on straight oil gas had intolerably hard flames on burners No. 1 to No. 3, satisfactory flames on No. 4 and No. 5 and yellow and soot forming flame on No. 6.

At this point it should be mentioned that the Bunsen burners merely give a visual indication of utilization range and since the burners themselves have different characteristics than those of appliances. The performance of the entire group of six burners therefore has no direct relation to substitute gas performance on a customer's premises.

Following the Bunsen burner demonstration, attention was directed to domestic appliances; the first again being the hot plate. The gas performed satisfactorily on all three burners, hard, normal and soft; however, traces of yellow tips were seen on the soft adjusted burner but not enough to cause soot formation. On the two Electrolux burners, the soft burner had flames with yellow tips and on defrost showed a yellow tip. The hard adjusted Electrolux burner was completely satisfactory. Mixture (b) burned well in the apartment-size Magic Chef without excessive sharpness on the hard burner and with faint traces of yellow tips on the soft adjusted burner.

Mixture (c)—25 percent LP-air gas—75 percent natural gas

On the Bunsen burner apparatus this gas was seen to have a shorter utilization range than 35 percent oil gas—65 percent natural gas but a wider range than the 100 percent oil gas as shown on the left bank. Even at the low concentration of 25 percent, the

mixture displayed the undesirable characteristics of LP-air gas. Flames that had a short blue cone also had yellow in the mantle or outer cone. Burner No. 6 with the softest setting showed complete failure due to luminosity and soot.

The hot plate burning mixture (c) showed a sharp somewhat difficult to ignite flame on the hard burner; a satisfactory flame on the normal burner; and a flame with considerable yellow tips on the soft adjusted burner. There was a yellow tipped flame on the soft adjusted Electrolux burner which is intolerable from the odor and sooting standpoint. The hard adjusted burner was quite satisfactory. When the control lever was moved to the defrost setting, the soft burner had yellow tips and the hard none. The performance of this mix on the Penninsular range was identical to the hot plate.

Mixture (d)—30 percent coke oven gas —70 percent oil gas

Both gases have a rate of flame propagation higher than natural gas. As a consequence, all of the undesirable features of oil gas will prevail.

Upon admission of this gas to the right bank of the Bunsen burner board burners No. 1 to No. 5 became intolerably hard, while No. 6 became yellow tipped. The flame of No. 1 lifted at intervals and was difficult to relight. This gas proved to have a shorter utilization range than 100 percent oil gas.

The hard burner of the hot plate emitted noise on extinction. The normal and soft burners were satisfactory.

The soft Electrolux burner gave off an acrid odor but burned with a blue flame which became yellow tipped on the defrost setting. The hard adjusted Electrolux burner had a sharp but stable flame that remained blue on defrost. This mixture produced unsatisfactory operation of the Barber water heater burner. There were yellow tips on turn down, early flash back with no recovery when the stop cock was at the full open position. The apartment-size Magic Chef range had one burner which was satisfactory, namely the soft adjusted burner. Yellow tips however were quite evident. The hard and normal burners were both difficult to ignite, and in addition, the hard burner emitted a loud noise on extinction. Penninsular range performance corresponds to that of the hot plate.

Mixture (e)—50 percent coke oven gas —50 percent LP-air gas

This mixture is a combination of coke oven gas with a relatively high rate of flame propagation, and LP-air gas with a low rate. On first consideration it would appear that this could be an ideal combination. Contrary to expectations, it did not prove to be so.

Admission of this mixture into the right bank of the Bunsen burner board showed that the utilization range was very limited. Five of the burners became intolerably hard, and burner No. 6 became luminous and sooty. The hot plate showed exceedingly sharp flame on the hard adjusted burner which tended to flash back on turn down and burn in the spud. The normal adjusted burner showed a hard flame which must be labelled undesirable. The soft burner had flames with large yellow tips.

The Electrolux with the soft adjustment was yellow tipped and odorous on both settings. The hard adjusted Electrolux burner had a lifting blue flame that remained blue on defrost.

The Barber water heater burner displayed yellow tips on turn down with flash back, burning in the spud, and no recovery on reopening.

The apartment size Magic Chef range, burning mixture (e), showed a satisfactory flame in the soft adjusted burner but with traces of yellow tips; a sharp flame on the normal burner, that proved to be difficult to ignite; and a very sharp flame on the hard adjusted burner that flashed back with a loud noise on extinction, and was very difficult to reignite. The Penninsular range seemed to utilize the gas mix in the most satisfactory manner. The soft burner had yellow tips but was tolerable, the normal burner was satisfactory and the hard burner had a sharp flame but was still tolerable.

Mixture (f)—50 percent LP-air gas— 50 percent oil gas

This gas mixture exhibited an intermediate utilization range on the Bunsen burner apparatus. It represented an improvement over either of the separate constituents, but was inferior to mixtures including natural gas in their make up. The flames were short but still tolerable on the hard adjusted burner of the hot plate; the normal burner was satisfactory and the soft had yellow tips, but was still tolerable.

The soft adjusted burner of the Electrolux had yellow tips and an acrid odor was noticeable in the products of combustion; the defrost setting also produced a flame with yellow tips. The hard adjusted Electrolux burner produced hard blue flames that showed a tendency to lift. The flame on defrost setting was blue and satisfactory.

The effect of 50/50 LP-air gas-oil gas mix in the Barber burner was to reduce some of the undesirable effects of the straight constituents; namely, the tendency to flash back and the failure to recover. There was no evidence of yellow tips on turn down.

The hard burner of the apartment-size Magic Chef range was difficult to ignite; the normal burner was satisfactory and the soft burner had a flame with a trace of yellow tip but was also satisfactory.

On the Penninsular range, both the soft and normal burners had yellow tips. The hard burner was satisfactory.

While the two remaining mixtures (g) and (h) were being prepared, a demonstration was made on the water heater burners and pilots located in the front room, using natural gas, oil gas and LP-air gas.

The demonstration table consisted of the following water heater burners and pilot burners:

(1) Two side arm burners—one adjusted hard and one soft.
(2) Two Servel burners—one adjusted hard and one soft.
(3) One Everhot burner equipped with a Milwaukee size spud.
(4) One Bastian & Morley burner with Milwaukee size tips.
(5) Two A. O. Smith slot type burners —one adjusted hard and one soft.
(6) Two Bryant burners—one adjusted hard and one soft.
(7) Pilot Burners.

Baso Rod & Tube Bimental General Controls Rutz	All pilots equipped with Milwaukee orifice sizes

Natural gas was admitted to all burners and pilots to show the adjustments. All burners performed satisfactorily with the exception of the Bastian & Morley burner which is an inherently noisy burner. Some of the pilots burned

with luminous flames, notably the Rutz, but were designed to do so.

All burners and pilots were switched to oil gas. The side arm burners both acquired yellow tips, the soft being intolerably luminous. The Everhot burner acquired yellow tips but not enough to be objectionable. The Bastian & Morley burner remained satisfactory but was more noisy.

The Servel burners, being mixed gas ribbon burners, functioned satisfactorily on oil gas, although a trace of yellow was apparent in the soft burner flame. The soft Bryant burner flame was yellow; the hard satisfactory.

Attempts were made to cause the burners to flash back on oil gas but with the exception of the hard Servel ribbon burner, all refused to. The hard adjusted Servel ribbon burner flashed back once but repeated efforts failed to repeat.

LP-air gas was then admitted to the water heater burner manifold. Yellow tips were in evidence on both side arm burners, particularly on the burner with the soft adjustment. The Everhot burner had a flame with a trace of yellow tips, and the Bastian & Morley burner became exceedingly noisy. The two Servel ribbon burners became sharp, the hard adjusted burner showing a very short flame. The soft adjusted Bryant burner flame became yellow tipped; the hard showed signs of lifting.

From the standpoint of relative utilization ranges, not much information could be gained from water heater burners due to the considerable latitude in their design.

In general the pilots on LP-air gas burned with more yellow in their flames than they had with oil gas. It is anticipated that the use of LP-air gas in these devices might result in complaints caused by odor or sooting.

At the end of this phase of the demonstration attention was again turned to the testing of the two final mixtures whose blending had been completed in the interim.

Mixture (g)—20 percent LP-air gas—35 percent oil gas—45 percent natural gas

This mixture contained the limiting percentages of the two high Btu substitute gases when used alone in natural gas. It is to be noted that this mixture containing 55 percent supplemental gas is more tolerable than the 20 percent LP-air and 35 percent oil gas respectively when used alone in natural gas. When burning this mixture in the right bank of the Bunsen burner apparatus it shows a fairly wide range of utilization. Of the six burners only the extremes performed in a manner which was questionable.

The hot plate's hard burner had a flame that was a trifle too sharp, the normal was satisfactory and the soft had barely discernable yellow tips and was also satisfactory.

The soft Electrolux burner had small yellow tips on both settings; the hard burner was quite satisfactory.

The Barber water heater burner functioned very well when using this mixture. The only defect was yellow tips on turn down. The Magic Chefs hard burner was a bit sharp, the other two burners performed in an acceptable manner. The Penninsular range showed yellow tips on the soft burner; the other two burners were satisfactory.

Mixture (h)—11 percent propane vapor (2,500 Btu)—30 percent oil gas—34 percent coke oven gas and 25 percent natural gas

The relative proportions of the constituents in this mixture are based on production potential of the manufactured gas plants of the company.

This mixture was first tried on the Bunsen burner apparatus. While the number of burners performing satisfactorily did not indicate it had the best characteristics, their performance could be rated tolerable.

Using mixture (h) the hard burner of the hot plate became sharp but not enough to be a likely source of complaint. The normal burner remained satisfactory and the soft burner displayed yellow tips to a moderate degree.

The soft burner of the Electrolux refrigerator burner showed yellow tips on both settings. The hard burner was satisfactory on a freeze setting but showed yellow tips on defrost.

The Barber burner showed yellow tips on turn down and flashed back; reopening the supply cock resulted in full recovery. The performance of the mixture (h) in this burner probably would not result in complaints.

The apartment size Magic Chef for some unexplained reason gave a flawless performance on mixture (h) on all three burners. This fact adds emphasis to the need of using a variety of

APPENDIX III—DATA ON DEMONSTRATIONS UTILIZING HIGH B.T.U. PROPANE MIXTURES
Appliances Adjusted on Natural Gas

	(i) Propane Air	(j) Propane Air	(k) 50% Oil Gas 50% 1800 Btu Propane Air	(l) 60% Oil Gas 40% Propane Vapor	(m) 40% Oil Gas 15% Propane Vapor 45% Coke Oven Gas
Btu	1400	1400	1355	1559	985
Specific Gravity	1.286	1.328	1.035	1.028	.844
Hot Plate					
Soft	Y. Tip	Y. Tip	Y. Tip	Y. Tip (all big)	Y. Tip
Normal	OK	Y. Tip	Y. Tip	Y. Tip (all big)	OK
Hard	Sharp Lifting	OK	Sharp	Y. Tip (all big)	Sharp
Electrolux					
Soft	Y. Tip	Y. Tip	Y. Tip	Y. Tip	Y. Tip
Defrost	Y. Tip	Y. Tip	Y. Tip	Y. Tip	Y. Tip
Hard	OK	Y. Tip	Y. Tip	Y. Tip	OK
Defrost	Y. Tip	Y. Tip	Y. Tip	Y. Tip	Y. Tip
Barber					
Turn Down	OK	Y. Tip	Y. Tip	Y. Tip	Y. Tip
Flash Back	No Flashback	No Flashback	No Flashback	No Flashback	Flashback
Recovery	—	—	—	—	No Recovery
Apt. Size Magic Chief					
Soft	Y. Tip	Y. Tip 4" High	Y. Tip 3" High	Y. Tip 6" High	Y. Tip
Normal	OK	Y. Tip 1" High	Y. Tip ½" High	Y. Tip 3" High	OK
Hard	OK	OK	OK	OK	Flashback
Penninsular Range					
Soft	Y. Tip	Y. Tip	Y. Tip	Y. Tip	Y. Tip
Normal	OK	Y. Tip	Y. Tip	Y. Tip	OK
Hard	Sharp	Y. Tip	OK	Y. Tip	Very Sharp

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[1] A. G. A. Publication (1948) "Gaseous Fuels," Page 179, Chap. VIII, Para. 65.
[2] A. G. A. Publication (1948) "Gaseous Fuels," Page 179, Chapter VIII.
[3] A. G. A. Publication (1948) "Gaseous Fuels," Page 155, Chapter VII.
[4] A. G. A. Publication (1948) "Gaseous Fuels," Page 156, Chapter VII.
[5] A. G. A. Publication (1948) "Gaseous Fuels," Page 157, Chapter VII.
[6] A. G. A. Publication (1948) "Gaseous Fuels," Page 157, Chapter VII.
[7] Report on Interchangeability of Substitute and Natural Gas by W. R. Fraser (1933) Unpublished.

appliances to evaluate the utilization range of a gas.

The Penninsular range had yellow tipped flames on the soft adjusted burner. The normal and soft burners were satisfactory.

D—Demonstration utilizing high Btu propane mixtures (For data see Appendix III)

A further series of demonstrations were conducted in which higher Btu gas mixtures were used. These were demonstrated on appliances of the rear room of the laboratory. Data obtained is recorded in Appendix III. In general these mixtures produced yellow tipped flames for all soft adjusted burners. This factor limits their suitability as supplemental gases.

E—Discussion and conclusions

The mixtures of gases used in the demonstration contained limiting percentages of standby gases with natural gas or optimum combinations of standby gases for maximum useability. Preliminary trials performed at the utilization laboratory on numerous combinations indicated generally, the limiting percentages of the components. Although data was already available for all of the possible combinations of standby and natural gas (6), tests were performed on at least three combinations of each pair of gases for purposes of confirmation.

Mixtures of 20, 30 and 50 percent coke oven gas in natural gas were tested. The investigation showed that the 20 percent mix was unquestionably satisfactory, that the 30 percent mix was tolerable and that the 50 percent was allowable in an emergency.

Tests of mixtures of 35 percent, 50 percent and 70 percent oil gas in natural gas indicated that the 35 percent mix was completely satisfactory and that 70 percent mix was tolerable. The 70 percent mixture caused the burners, which had been adjusted on the soft side of normal, to display traces of yellow tips and the hard burner to become rather noisy, but without a tendency to flash back.

Propane-air gas of 1,200 Btu per cubic foot was mixed with natural gas in the percentages by volume of 15, 30 and 45 percent propane-air gas. The 15 percent mixture was unquestionably satisfactory, 30 percent normally tolerable and 45 percent was considered tolerable in emergency. Test data indicated that if propane-air gas exceeded 45 percent, the mixture was inferior to the performance of 100 percent propane-air gas.

Oil gas and coke oven gas mixtures were tested at 20, 30 and 40 percent coke oven gas. It was determined that the addition of coke oven gas does not improve the yellow tip conditions of the soft burner, and that the undesirable features of the hard burner namely, flash back and noise on extinction are accentuated. It was concluded that mixtures of oil gas and coke oven gas should not be used except in extreme emergency.

Propane-air gas (1,200 Btu) and oil gas were investigated in the combinations of 40, 55 and 70 percent propane-air gas. Tests made of these mixtures indicated that propane-air gas can be mixed with oil gas in any proportion and generally improve burning characteristics. However, it was found that in mixtures containing more than 50 percent propane-air gas, there was a marked tendency for the soft burners to soot but that all tendency to flashback is eliminated. A 50/50 mixture proved to be the optimum combination of these gases.

The final pair of mixtures tested in the preliminary investigation involved three constituents. The following mixtures were tested.

(1) 20 percent propane-air gas, 30 percent oil gas, 50 percent natural gas.

(2) 35 percent propane-air gas, 35 percent oil gas, 30 percent natural.

Results of the test showed mixture (1) to be normally tolerable and mixture (2) to be unsatisfactory because of yellow tip conditions on the soft adjusted burners. On the basis of these findings, it was decided to use a mixture of 20 percent propane-air gas, 35 percent oil gas and 45 percent natural gas in the final demonstration.

A mixture not investigated at this time as those above, but for which data was available, was coke oven gas enriched with undiluted propane-vapor. It was concluded that straight propane enrichment was unsatisfactory and that bad soot conditions existed for any enrichment in excess of 20 percent propane-vapor. It was also determined that there was no recovery from flash back in Barber tip burners when using high ratios of enrichment.

The demonstrations show that:

(1) Propane-air gas, oil gas or coke oven gas as a standby gas cannot be used as a 100 percent interchangeable gas for natural gas.

(2) Any one, or a combination of these gases, may be added to natural gas in the limiting percentages indicated to augment the city's gas supply in the event of partial pipeline failure.

(3) The mixture of 11 percent L.P.G. vapor, 30 percent oil gas, 34 percent coke oven gas and 25 percent natural gas, which corresponds to Milwaukee Gas Light Company's maximum existing and contemplated production and storage facilities, has a semi-tolerable useability and may be safely used in the event of a complete failure of natural gas supply.

F—Summary of Results

Kind of Gas	*Useability Rating*
Natural gas (adjust gas)	satisfactory
LP-air gas	not tolerable
Oil gas	not tolerable
(a) 30% coke oven gas 70% natural gas	satisfactory
(b) 35% oil gas 65% natural gas	satisfactory
(c) 25% LP-air gas 75% natural gas	tolerable
(d) 30% coke oven gas 70% oil gas	not tolerable (failure)
(e) 50% LP-air gas 50% coke oven gas	not tolerable
(f) 50% LP-air gas 50% oil gas	not tolerable
(g) 20% LP-air gas 35% oil gas 45% natural gas	satisfactory
(h) 11% propane vapor 30% oil gas 34% coke oven gas 25% natural gas	tolerable
(i) propane-air (1400 Btu 1.286 sp. gr.)	satisfactory
(j) propane-air (1400 Btu 1.328 sp. gr.)	tolerable
(k) 50% oil gas 50% propane-air (1800 Btu)	tolerable
(l) 60% oil gas 40% propane vapor	not tolerable
(m) 40% oil gas 15% propane vapor 45% coke oven gas	not tolerable

Conversions

(Continued from page 23)

By analyzing column "d", the conclusion was drawn that, although many of the leak complaints may have been caused by the mechanical conversion of the appliances, most certainly an appreciable number were not. It was therefore reasoned that many minor leaks existed prior to conversion. But because of the difference in odor of the two gases and the publicity given the conversion job, the customer became more critical of appliance operation and more safety conscious, and requested service that normally would not have been requested. Although the conversion was completed in October 1947, the leak calls did not return to normal until about the middle of December of that year. The peak shown in October 1947 was caused by the accumulated effect of leaks from newly converted areas plus leaks at house heating equipment converted during the summer which were not detectable until the equipment was started.

Chart IV shows the leak experience before and after a changeover for another company.

Still another company, which converted August to October 1949, reported leaks in January to May 1950 were 25 percent higher than same period 1949. In June and July 1950 they dropped below same period last year.

One organization that studied leaks at service regulators has recorded the following data:

	Regulators Inspected	*Number Leaking*	*Percentage Leaking*
Prior to natural gas	9,737	1,557	15.9
After natural gas	15,892	4,217	26.5

In general, leak complaints will increase appreciably during and after a changeover. This is due to some extent to the mechanical conversion of the appliances but to a larger degree due to the drying of gasketed joints, meter washers, regulator diaphragms, change in odor, slower ignition of range top burners and psychological effect of a complete readjustment of burners.

You probably will find that converting burners to rated input results in numerous complaints. In many cases the input prior to conversion was either smaller or greater than rating, according to the whim of the consumer. Especially is this true in the case of hotel and restaurant equipment. The typical chef has always insisted on over-gassed burners and unless you reproduce this condition at time of conversion you most certainly will receive requests for readjustments.

With the increase in service requests during and immediately after conversion it would be well to remember that planning for receiving and handling of this abnormal quantity of service requests is essential. Quoting again from the 1930 Subcommittee Report previously mentioned, "It is recommended telephone facilities be investigated and a definite and strict routing of complaints be established to avoid delay, confusion and duplication."

I am sorry to say that in many changeovers the completion of the conversion job does not mean immediate termination of service department difficulties. The distribution of the new gas having characteristics vastly different from the old gas, along with changes in system pressures and flows, creates conditions resulting in many complaints. The most typical of these changes are the drying of the system resulting in dust, the picking up of naphthalene and gum, and the increase of suspensoids caused by reversal of flow.

Washington experience

I recommend for study a recent article, "How Staten Island Converted to Natural Gas" by J. V. Turpish. I also would like to point out what happened in Washington.

Almost simultaneously with our peak load of house heater starts and service requests caused by a sudden cold snap, we experienced a great increase in pilot outages, particularly on ranges and water heaters. The peak week occurred during the week ending September 27, 1947. During that time the telephone service bureau received approximately 17,000 service requests as compared to 2,000 for same week the year before. Six thousand of these were for furnace starts.

At first the pilot difficulty was confined to a relatively small area but later spread over a larger territory. By pinpointing the location of pilot outages and photographing the map daily, the progress of the trouble was followed. Gum trouble had not been anticipated for we had never before heard of a manufactured gas company converting to natural gas and then finding itself right in the midst of a gum problem, so when trouble first appeared we thought the "dust storm" had arrived.

Investigation showed fresh gum was being deposited in the pilot. This lasted for several months and then subsided. In the meantime, gum filters were installed in pilot lines as rapidly as possible.

In November 1947 we received about 26,000 service calls for water heaters and ranges. We discovered that approximately 60 percent of those calls were confined to a particular area. Normally we would expect about 7,000 calls.

A possible explanation of this phenomenon may be the fact that early in 1947, just before changeover, we had occasion to use a substantial quantity of carburetted water gas and it is entirely probable that quite a bit of vapor phase gum was laid in the system then. When the fall season came along this gum started to decompose and was carried in the gas stream. The NO was liberated from the decomposed gum and joined with other constituents to make fresh vapor phase gum.

Since conversion, a careful watch has been kept on pilot outages to detect sections of the system which may be drying to the extent that the gas stream carries suspensoids and proves a source of trouble. As such areas appeared, our chemists studied the suspensoids by the use of a portable Tyndall Beam apparatus and other means. Pilot filter installations were made at time of service calls. As soon as practical the area was wet down by gravity method, using a compound sold commercially for stopping leaks at main joints. After treatment with this material the Tyndall Beam checks showed immediate allaying of suspensoids and trouble cleared. During '48 and the early part of '49 the older and most troublesome areas were treated, and now we experience no localized difficulty of this nature.

Another problem for consideration is the effect of substitute gas, if such is required. Here again I refer to operations in Washington.

Our company redesigned the production equipment to produce a high Btu oil gas to act as a substitute for natural. In January 1948 the supply of natural gas was curtailed due to a line break and

because of the load demand created by cold weather, it became necessary to manufacture gas.

When the manufactured gas was distributed, even though mixed with natural, the change in the odor was so great we received an all time high of 2,500 leak orders in one week, 1,500 of which were received in two days. During this period of manufacturing, pilot calls increased appreciably due to the distribution of gum in the "make" gas. This is one of the reasons we recommend consideration of the installation of gum filters on all pilots.

Manufacturing and mixing of high Btu oil gas and natural gas also presents another service problem. If a certain percentage of manufactured to the total is exceeded, the rate of flame propagation increases to the point where you may expect trouble due to the utilization of this gas in burners with port areas relatively large, designed to burn natural gas. When adjusting burners during the time high Btu oil-natural gas mixture is being used, it is highly important to instruct your service personnel regarding hardness or softness of flame, so satisfactory adjustment results without a call-back when you return to normal operations.

With all these headaches you may ask, "Doesn't a changeover result in anything worthwhile as related to the operations of a service department?"

I am happy to say that the consensus of opinion for companies that have experienced a changeover to natural gas, presents an encouraging story.

In general, after the immediate problems of conversion are back of you and the gas suspensoid condition is well under control, you may expect less service work per appliance than before changeover.

One operator reports, "We feel that with natural gas we still will have our troubles, maybe some new ones, but when we finally clean up our territory our troubles will be less than what they were during manufactured gas operations."

Experience in Washington in connection with this is shown on Chart V. Here you see orders per appliance for the four major appliances, plotted by years since 1940. The years 1940 and 1941 may be assumed to be normal years for we experienced a decrease in orders per appliance during the war. So, when comparing years after conversion, we should go back to 1940 and 1941 for base.

Water heaters and ranges probably present the most comparable appliances for there has been no major change in service policy regarding these two appliances since 1940. The more favorable position of refrigerators compared to '40 and '41 reflects to a minor degree a change in policy (we have discontinued voluntarily cleaning refrigerators on a schedule which we were doing in '40 and '41). Excluding the voluntary service, the calls per year per refrigerator were 1.00 and 0.80 in 1940 and 1941, respectively.

The appliance showing the most favorable change is the house heater. There are two factors, unrelated to use of natural gas, which have influenced this trend: (1) a more intensive campaign to have customers leave their house heating equipment pilots on during the summer, or, learn to start and turn-off without requesting company service, and (2) the degree days in '48 and '49 were 4,124 and 3,448, compared to 4,726 and 4,087 in '40 and '41, respectively. To enumerate the effect of each will require too much detailed discussion.

I do want to point out that by the use of natural gas a very appreciable savings has been realized in eliminating practically all voluntary inspections and cleans of house heating equipment. Prior to the use of natural gas we had all our house heating installations on a periodic clean schedule, varying from yearly to once every four years, depending on the make and type of appliance. To date we have not found it justifiable to make periodic inspections or cleans of this equipment.

Those of you who care to investigate the matter of a changeover should obtain from A. G. A. Headquarters "Bibliography on Changeover from Manufactured to Natural Gas 1928—April 1950" listing 139 articles which have appeared in A. G. A. and other association publications, gas trade journals, etc.

Statement of the Ownership, Management, Circulation, Etc., Required By the Act of Congress of August 24, 1912, as Amended by the Acts of March 3, 1933, and July 2, 1946

Of American Gas Association Monthly published monthly, except July and August. Bi-monthly then; at Brattleboro, Vermont for October 1, 1950.

State of New York, County of New York, ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Jac A. Cushman, who, having been duly sworn according to law, deposes and says that he is the Editor of the American Gas Association Monthly and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily, weekly, semiweekly or triweekly newspaper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the act of August 24, 1912, as amended by the acts of March 3, 1933, and July 2, 1946 (section 537, Postal Laws and Regulations), printed on the reverse of this form, to wit:

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JAC A. CUSHMAN, Editor.

Sworn to and subscribed before me this 28th day of September, 1950.

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Gas clothes dryer

(Continued from page 26)

gas water heating load in any areas where the competition is alert and the kilowatt-hour rate reasonably low.

Each gas dryer installation is a positive factor in holding gas in the home and preventing competitive fuels from taking its place. This is as important to you as the actual addition to the base load.

Some will say, "That sounds good, but get to the point. What will it do as a load builder?"

We peddlers have been telling you for years that the automatic gas dryer *is* a load builder, but I don't think we've proved it to you. I should like to try to do that.

For example, there were 36,000 new owners of gas clothes dryers during the first eight months of 1950. What do these 36,000 dryers mean to the gas industry in terms of revenue? Just this!

A family of four averages from ten to 12 dryer loads of clothes per week. The average weekly cost of gas to dry these loads is approximately 15 cents. Therefore, at the end of one year, those 36,000 gas clothes dryers will have brought to

the gas industry about $280,000 in new revenue.

Let's look at it in another way—the bigger way. The electric industry has announced they are aiming at ten percent saturation on electric clothes dryers, instead of the present five percent of homes wired for 220-volts.

How about the gas industry? Would a ten percent saturation be worth while?

This will give you a rough idea. According to GAMA figures, there were more than 27 million gas ranges in use in this country at the end of last year. A ten percent saturation of automatic gas clothes dryers would mean approximately 2,700,000 units.

At our average operating cost figure of 15 cents per week, this would mean $405,000 additional revenue per week or an amazing total of $21,060,000 new revenue per year for the gas industry! Isn't that worth going after?

On behalf of all the gas dryer manufacturers, please accept our check in that amount, and our thanks for the opportunity to tell our story.

Truth in action

(Continued from page 8)

through our elected representatives. Far from it. By intelligent and intense participation in national affairs, we will stabilize our government and broaden its representative and responsible character.

No matter how busy, you should become better acquainted with political leaders and with your public officials.

Every American citizen of any standing should—as a matter of course—know the members of Congress from his part of the country, at least through correspondence—and, better still, through close personal acquaintance.

The next suggestion—a most important one—is for you to make your own political views available to the public—and particularly to the people who work for and with you.

Voters need and want your advice. It is astonishing how many unthinking persons, who are dependent on the returns of industry for their livelihood, turn to some crackpot for advice on public matters, when the business man is too busy or too timid to offer his advice.

The next step—and the hardest of all for a busy person—is to get out and work for your political organizations. Give them some of your time. Practically every business man is willing to contribute cash—but too many business men stop right there.

The next step is to vote—and to help get out the vote on election day.

There is one more thing you can do to help win today's struggle for freedom: You can have a thorough program of public relations and *human relations* in your own business concern.

You will do much to help win the battle against socialism, if you tell the facts of life about business and the business system to your employees.

The principal requirement is that you use real, honest, understandable facts, not bees-and-flowers platitudes.

Tell them what your company is doing—what your competitors are doing. Tell them what the figures in your accounting department are all about. Tell them what happens to the sales dollar you receive from the customer. Tell them about the new dollars of capital you would like to have to buy more tools. Show how many dollars it takes to make just one job in the plant. Show them that their jobs give them more take-home pay and offer greater opportunities under free enterprise than they would under Socialism.

Show them how protection against sickness, accident and old age is greater under our American way of life than it could be under socialism—or under paternalistic "welfarism." Make it clear that your policies are progressive and adaptable to change.

You will be amazed at how new and interesting some of these things can be to workers. And you will be amazed, too, at how you can clear up misunderstandings and wrong assumptions.

Telling employees what makes the business system tick is not a difficult task. I sincerely believe that it is one of the most important obligations which confronts everyone in business in America.

All this can be wrapped up in a sentence: Wherever you are, *put truth in action.*

Only truth in the minds of the vast majority of Americans—and only cooperation in their hearts—can save America from the insidious propaganda of those who sow the seeds of discord and strife in our communities and our national life; who make promises they know they cannot fulfill; who set one group against another; who present, as new cure-alls, old tricks that have failed 10,000 times in history.

Ignorance, prejudices and indifference have enslaved and ruined countless nations, but today—"The *truth* shall make you free."

1951

JANUARY

3-5 •A. G. A. Home Service Workshop, Hotel Statler, Washington, D. C.

MARCH

12-14 •Mid-West Gas Association, annual convention, Hotel Fontenelle, Omaha, Neb.

29-30 •New England Gas Association, annual meeting, Hotel Statler, Boston

29-30 •Oklahoma Utilities Association, annual convention, Mayo Hotel, Tulsa, Okla.

APRIL

2-4 •A. G. A. Sales Conference on Industrial and Commercial Gas, Industrial and Commercial Gas Section, Shoreham Hotel, Washington, D. C.

9-11 •A. G. A. Mid-West Regional Gas Sales Conference, Residential Gas Section, Edgewater Beach Hotel, Chicago, Ill.

10-12 •Southwestern Gas Measurement Short Course, University of Oklahoma, Norman, Okla.

16-18 •A. G. A. Distribution, Motor Vehicles and Corrosion Conference, Hotel Peabody, Memphis, Tenn.

16-18 •GAMA annual meeting, Drake Hotel, Chicago, Ill.

23-25 •Southern Gas Association, Biloxi, Miss.

23-25 •National Conference of Electric and Gas Utility Accountants, Hotel Sherman, Chicago, Ill.

26-27 •Indiana Gas Association, French Lick Springs Hotel, French Lick, Ind.

MAY

7-8 •A. G. A. Natural Gas Department, spring meeting, Baker Hotel, Dallas, Texas

7-9 •Missouri Association of Public Utilities, Jefferson Hotel, St. Louis, Mo.

7-11 •National Restaurant Exposition, Navy Pier, Chicago, Ill. (A. G. A. will exhibit)

14-16 •A. G. A. Production and Chemical Conference, Hotel New Yorker, New York, N. Y.

14-18 •A. G. A. Industrial & Commercial Gas Section, Industrial Gas School, William Penn Hotel, Pittsburgh, Pa.

15-17 •Pennsylvania Gas Association, Wernersville, Pa.

OCTOBER

15-18 •A. G. A. annual convention, St. Louis, Mo.

Personnel service

SERVICES OFFERED

Accountant—Over 20 years' experience public utilities, individual and consolidated companies. Auditing, financial accounting, taxes, original cost of plant, writing and reviewing reports and general accounting. Available for New York City or 300 miles radius. **1659.**

Executive—Ex Colonel—World War II. Previously Executive Vice-President Public Utilities Holding Company and subsidiaries with fifteen years' previous experience in banking, brokerage and general business. Experienced in dealing with S.E.C., R.F.C., State Commissions, City Governments, Banks and Underwriters, Refinancing and Public Utility management. **1660.**

M. A. Columbia, Nine years' experience with public utility regulatory agency, desires location Metropolitan New York area. Qualified to perform all phases of **Rate, Tariff** and **Cost** of service work, develop supply and requirement data, and prepare exhibits in connection with rate proceedings. (35). **1661.**

Manager or **General Superintendent.** 20 years' experience in plant and distribution operation and maintenance. Eight and one-half years of this time spent as manager. Resumé of experience furnished on request. Interviews can be arranged. Available on 30 days' notice. Eastern or Southern location preferred. **1662.**

Gas Sales and **Promotion**—Diversified experience in all phases of gas sales, fuel estimates, layout and design of equipment, installation and servicing including the training and supervision of men for Industrial, Commercial and Housheating. Many years' experience. Desires to locate in the Pacific Northwest. **1663.**

POSITIONS OPEN

Gas Engineer, young man with engineering background and several years' experience around carburetted water gas sets. Small company in Pennsylvania anthracite field. Low living costs. Good salary. Write for appointment, giving age, education and experience. **0592**

Natural gas interstate pipeline company, located in the middle west, has immediate need for an **Assistant** Plant Records **Supervisor.** Adequate salary commensurate with qualifications. In reply state in detail past experience, education, age, references, salary requirements, and enclose small photo. Replies confidential. **0593.**

Sales Manager for gas utility with 28,000 meters and a growing bottle gas business. Operations cover manufactured gas, propane air and recently converted natural gas service. Location —Pennsylvania. **0594**

Round-table

(Continued from page 23)

shows that the total life expectancy of an average 20-year old white male worker has increased 5½ years from 1900 to 1940 but that his work life expectancy rose only 2.6 years. As a result, the number of years which he can expect in retirement more than double, i.e., from 2.8 to 5.7 years. The Bureau states in its report that this comparison and others contained therein "focus attention on one of the pivotal aspects of old-age dependency. Individually and collectively, vital decisions will be made in the coming decades as to the disposition of the latter years of life between retirement and continued productive activity."

Copies of "Tables of Working Life" can be obtained at 40 cents each from Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

● **Studying wage changes**—The analysis of wages that appears in the October issue of *The Business Record* published by National Industrial Conference Board provides a helpful background for wage negotiations.

Changes in factory wages since 1939 are shown as measured by all the various yardsticks—basic wage rates, straight-time hourly earnings, gross or "average" hourly earnings, weekly earnings before and after taxes, and annual earnings. Both the actual and "real" figures are given for significant dates between August 1939 and July 1950 in a two-page tabulation. Individual companies can see how their own wage changes compare with these national averages. The trends in paid holidays, vacations, pensions and welfare plans over the past decade are likewise summarized for handy reference.

Major conclusion of the study is that the average factory worker faces the current war emergency from a more advantageous position than he did in World War II. His wages are at record levels, and he has more leisure for which he is paid and more security.

● **Cost of fringe benefits**—U. S. Chamber of Commerce found in a survey of 690 companies that the average cost of the non-wage benefits was 23.7 cents in addition to wage rates. Prepared by the Economic Research Department of the Chamber, "Wage Supplements" covers the benefits received by the four million workers in these 690 firms. Represented in the survey are members of manufacturing, public utility, transportation, finance, mining, service and trade groups. When compared with the results of a similar study made in 1947, the 1949 survey shows cost of these so-called "fringe" benefits has increased about 29 percent.

● **Preliminary returns of the 1950 census** shows that there are 11,500,000 persons over 65 years of age in the population, a total greater than previous estimates anticipated. Only 45 percent of the men and nine percent of the women over 65 are considered to be actively working as part of the country's total labor force. This compares with much higher percentages several decades ago, reports Twentieth Century Fund.

● **Dependency record**—Generally, information about an employee's dependents is available somewhere in the employment records. But often it's not complete, hard to find or not up-to-date. This problem reached such proportions at a division of the Wyman-Gordon Company that a special "Dependency Record" form was developed and adopted.

The form is simple, easy to fill out and easy to check. The Company reports that, besides its more obvious uses—in connection with withholding tax, social security, group insurance, workmen's compensation —the form has a special advantage when planning recreational and social activities for employees. Knowing the age and sex of persons likely to attend makes it easier to organize and run such events as the children's Christmas party and annual picnic.

The beginning of the calendar year—only a few weeks away now—is a good time to put a form like this into effect. Information so gathered will set you up for the full year. And it can be readily checked on an annual basis to keep data always up-to-date.

● **Arbitration award set aside**—A recent court decision in New Jersey rules that an arbitration board appointed under the State law in making an award, failed to base its conclusions upon the standards established by the law.

The Supreme Court of New Jersey set aside an arbitration award involving New Jersey Bell Telephone Company. Previously, the Superior Court, Appellate Division, had upheld an order of the Statutory Board of Arbitration which had granted a wage increase and a modified union shop to 11,000 employees of the company's traffic division. The company, in its appeal to the Supreme Court of New Jersey, challenged the constitutionality of the State statute dealing with labor disputes in public utilities, contended that the order awarding a modified union shop was in violation of the Labor-Management Relations Act of 1947, and contended that the standards used to guide the boards of arbitration represented improper delegation of legislative powers. The Supreme Court upheld the constitutionality of the act itself but found defects in its application by the Board of Arbitration. The Court reversed the judgment of the Superior Court, Appellate Division, and remanded the case to that body.

● **Labor press**—Do you read the union newspaper in your company? The Department of Labor will help put a finger on which labor periodicals cover your industry and area. Just republished is the "American Trade Union Journals and Labor Papers Currently Received by the Department of Labor Library." Copies are free. Write to Librarian, Department of Labor.

● **Bibliography available**—The September 1950, issue of "Industrial and Labor Relations—Abstracts and Annotations" published by the Library, New York State School of Industrial and Labor Relations, contains a list of 16 current and periodical publications of interest to those in the industrial and labor relations field. There is an abstract or annotation for each publication which tells in a few words what the publication contains, the author, the publisher and the cost, if any. Copies of this bibliography may be obtained free from Library, Cornell University, Ithaca, N. Y.

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